UPDATED EDITION

Simply Good and Beautiful

MATH 5

ANSWERS & SOLUTIONS

The Good and the Beautiful CURRICULUM

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ANSWERS & SOLUTIONS

The Good and the Beautiful CURRICULUM

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Note to Parents

Math 5 Answers and Solutions **includes detailed solutions for all problems in the course book. Final answers are highlighted for easy reference.**

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NUMBER PATTERNS

Video Lesson

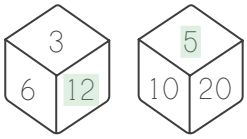
Top Box

3 + 3 = 6
6 + 3 = 9
9 + 3 = 12
12 + 3 = 15
15 + 3 = 18
18 + 3 = 21
21 + 3 = 24
24 + 3 = 27
27 + 3 = 30

3, 6, 9, 12, 15, 18, 21, 24, 27, 30

Bottom Box

first cube:	2 × 2 = 4	4 × 2 = 8
second cube:	6 × 2 = 12	12 × 2 = 24
third cube:	3 × 2 = 6	6 × 2 = 12
fourth cube:	5 × 2 = 10	10 × 2 = 20



Practice

1. The drawings may vary, but the third box should have a plant with seven leaves and the fourth box should have a plant with nine leaves.

2. 4 + 8 = 12
12 + 8 = 20
20 + 8 = 28
28 + 8 = 36
36 + 8 = 44
44 + 8 = 52
52 + 8 = 60

4, 12, 20, 28, 36, 44, 52, 60

3.

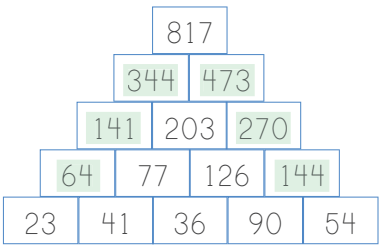


4. 1, 3, 5, 7, 9, 11, 13, 15

5. Notice that 41 + 36 (adjacent blocks) have a sum of 77 (the block above them). Similarly, 36 + 90 = 126, and 77 + 126 = 203.

To find the number in each block, add the two blocks below it.

23 + 41 = 64
90 + 54 = 144
64 + 77 = 141
126 + 144 = 270
141 + 203 = 344
203 + 270 = 473
344 + 473 = 817



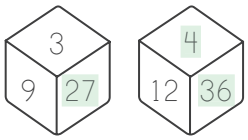
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6. 54 − 9 = 45
45 − 9 = 36
36 − 9 = 27
27 − 9 = 18
18 − 9 = 9
9 − 9 = 0

54, 45, 36, 27, 18, 9, 0

7.

first cube:	1 × 3 = 3	3 × 3 = 9
second cube:	2 × 3 = 6	6 × 3 = 18
third cube:	3 × 3 = 9	9 × 3 = 27
fourth cube:	4 × 3 = 12	12 × 3 = 36



8. a. top row: 5, 4, 3, __
The numbers are decreasing by 1.
5, 4, 3, 2

bottom row: 6, 5, 4, __
The numbers are decreasing by 1.
6, 5, 4, 3



b. top row: 0, 2, 4, __
The numbers are increasing by 2.
0, 2, 4, 6

bottom row: 6, 4, 2, __
The numbers are decreasing by 2.
6, 4, 2, 0



c. top row: 1, 2, 4, __
The numbers are doubling.
1, 2, 4, 8

bottom row: 1, 2, 3, __
The numbers are increasing by 1.
1, 2, 3, 4



9. 22, 20, 18, 16, 14, 12, 10

10. 12 + 12 = 24
24 + 12 = 36
36 + 12 = 48
48 + 12 = 60
60 + 12 = 72
72 + 12 = 84
84 + 12 = 96
96 + 12 = 108

$12, $24, $36, $48, $60, $72, $84, $96, $108

11. 91 − 7 = 84
84 − 7 = 77
77 − 7 = 70
70 − 7 = 63
63 − 7 = 56
56 − 7 = 49
49 − 7 = 42
42 − 7 = 35
35 − 7 = 28
28 − 7 = 21
21 − 7 = 14
14 − 7 = 7

$91, $84, $77, $70, $63, $56, $49, $42, $35, $28, $21, $14, $7

13 months

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12. There should be 10 spots on each half of the fourth insect. Each insect has 3 more spots on each half than the insect before.



Review

1. ~~782~~ (15) ~~1,844~~ (621) ~~5,730~~

2. a. 12 × 12 = 144

b. 121 ÷ 11 = 11

c.
```
   61
 × 42
  122
+2440
 2,562
```

d.
```
  25
5)125
 -10
  25
 -25
   0
```


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FACTORS OF PRIME AND COMPOSITE NUMBERS

Video Lesson

Top Box

1 × 3, 3 × 1
1, 3

Bottom Box

1 × 6, 6 × 1, 2 × 3, 3 × 2
1, 2, 3, 6

Practice

1. 1 × 42 = 42
2 × 21 = 42
3 × 14 = 42
6 × 7 = 42

Factors: 1, 2, 3, 6, 7, 14, 21, 42

2. prime

3.
$$\begin{array}{r} {\scriptstyle 4}\\ 16\\ \times\ \ 8\\ \hline 128 \end{array}$$

128 seeds

4. yes

Dividing by 2 twice is the same as dividing by 4.

128 ÷ 2 = 64
64 ÷ 2 = 32

Each person will get 32 seeds.

5.

Can you divide evenly into groups of	Yes or No	Number of Seeds for Each Person
5?	yes	200 ÷ 5 = 40
6?	no	X
10?	yes	200 ÷ 10 = 20

6.

Number	Factors	Prime or Composite
8	1, 2, 4, 8	composite
17	1, 17	prime
22	1, 2, 11, 22	composite

7. 2 and 5 are prime and 2 + 5 = 7.
2 and 5

8. 2 × 5 = 10

9. 3 and 13 are prime and 3 + 13 = 16.
3 and 13

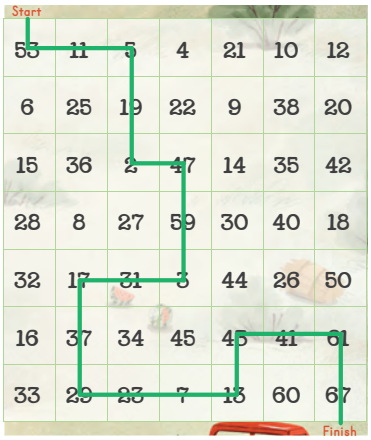
5 and 11 are prime and 5 + 11 = 16.
5 and 11

10. 5 and 7 are prime and 5 × 7 = 35.
5 and 7

11. 5 + 7 = 12

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12.



Review

1. a.
$$\begin{array}{r} {\scriptstyle 1} \\ 72 \\ \times\ 36 \\ \hline 432 \\ +\ 2\,160 \\ \hline 2{,}592 \end{array}$$

b.
$$\begin{array}{r|l} & 28 \\ \hline 6 & 168 \\ -\ 12 & \\ \hline 48 & \\ -\ 48 & \\ \hline 0 & \end{array}$$

2. a. 128 + 12 = 140
140 + 12 = 152
152 + 12 = 164
164 + 12 = 176
176 + 12 = 188
188 + 12 = 200

128, 140, 152, 164, 176, 188, 200

b. 843 − 20 = 823
823 − 20 = 803
803 − 20 = 783
783 − 20 = 763
763 − 20 = 743
743 − 20 = 723

843, 823, 803, 783, 763, 743, 723

3. a.
$$\begin{array}{r} {\scriptstyle 1\ 1} \\ 3{,}417 \\ +\ 1{,}386 \\ \hline 4{,}803 \end{array}$$

b.
$$\begin{array}{r} {\scriptstyle 7} \\ \not{8}27 \\ -\ 336 \\ \hline 491 \end{array}$$

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DIVISIBILITY STRATEGIES

Video Lesson

The number is divisible by 2 because it is even.

2 + 4 + 3 + 2 + 0 + 1 + 3 + 1 + 1 + 0 + 4 + 0 = 21 21 is divisible by 3, so 243,201,311,040 is divisible by 3.

The number formed by the last two digits (40) is divisible by 4, so 243,201,311,040 is divisible by 4.

The number is divisible by 5 because it ends in a 0.

The number is divisible by 6 because it is divisible by both 2 and 3.

The sum of the digits (21) is not divisible by 9, so 243,201,311,040 is not divisible by 9.

The number is divisible by 10 because it ends in a 0.

(2) (3) (4) (5) (6) ~~(8)~~ (10)

Practice

1. a. To be divisible by 3, the sum of the digits must be divisible by 3.

41: 4 + 1 = 5 5 is not divisible by 3, so 41 is not divisible by 3.
90: 9 + 0 = 9 9 is divisible by 3, so 90 is divisible by 3.
111: 1 + 1 + 1 = 3 3 is divisible by 3, so 111 is divisible by 3.
213: 2 + 1 + 3 = 6 6 is divisible by 3, so 213 is divisible by 3.
1,407: 1 + 4 + 0 + 7 = 12 12 is divisible by 3, so 1,407 is divisible by 3.
5,123: 5 + 1 + 2 + 3 = 11 11 is not divisible by 3, so 5,123 is not divisible by 3.

41 (90) (111) (213) (1,407) 5,123

b. To be divisible by 4, the number formed from the last two digits must be divisible by 4.

116: 16 is divisible by 4, so 116 is divisible by 4.
243: 43 is not divisible by 4, so 243 is not divisible by 4.
332: 32 is divisible by 4, so 332 is divisible by 4.
536: 36 is divisible by 4, so 536 is divisible by 4.
2,020: 20 is divisible by 4, so 2,020 is divisible by 4.
7,108: 8 is divisible by 4, so 7,108 is divisible by 4.

~~116~~ 243 ~~332~~ ~~536~~ ~~2,020~~ ~~7,108~~

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c. To be divisible by 9, the sum of the digits must be divisible by 9.

117: 1 + 1 + 7 = 9 9 is divisible by 9, so 117 is divisible by 9.
443: 4 + 4 + 3 = 11 11 is not divisible by 9, so 443 is not divisible by 9.
621: 6 + 2 + 1 = 9 9 is divisible by 9, so 621 is divisible by 9.
2,898: 2 + 8 + 9 + 8 = 27 27 is divisible by 9, so 2,898 is divisible by 9.
3,816: 3 + 8 + 1 + 6 = 18 18 is divisible by 9, so 3,816 is divisible by 9.
8,010: 8 + 0 + 1 + 0 = 9 9 is divisible by 9, so 8,010 is divisible by 9.

117 443 621 2,898 3,816 8,010

2. The factors of the number of sticks are 1, 2, 3, 4, 6, and 12.

1 × 12 = 12
2 × 6 = 12
3 × 4 = 12

12 sticks

3.

Number	Factor Pairs	Factors
10	1 × 10, 2 × 5	1, 2, 5, 10
15	1 × 15, 3 × 5	1, 3, 5, 15
28	1 × 28, 2 × 14, 4 × 7	1, 2, 4, 7, 14, 28
30	1 × 30, 2 × 15, 3 × 10, 5 × 6	1, 2, 3, 5, 6, 10, 15, 30
12	1 × 12, 2 × 6, 3 × 4	1, 2, 3, 4, 6, 12
17	1 × 17	1, 17

4. a. 8 friends + you = 9 people

1 + 8 + 9 = 18, which is divisible by 9. Therefore, 189 is divisible by 9. It is possible to divide the rocks equally among 9 people.

yes

b.
$$\begin{array}{r} 21 \\ 9\overline{)189} \\ -18\downarrow \\ \hline 09 \\ -\ 9 \\ \hline 0 \end{array}$$

189 ÷ 9 = 21

21 rocks

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5. Use the facts given to cross off numbers. Facts may be used in any order, so some numbers may already be crossed off when using a new fact.

I am greater than 100.
Cross off all numbers that are not greater than 100. Cross off 5, 6, 14, 27, 32, 84, and 98.

I am divisible by 3.
Cross off all numbers that are not divisible by 3. Those numbers are shown below.
5: 5 is not divisible by 3.
14: 14 is not divisible by 3.
32: 32 is not divisible by 3.
98: 9 + 8 = 17 17 is not divisible by 3, so 98 is not divisible by 3.
310: 3 + 1 + 0 = 4 4 is not divisible by 3, so 310 is not divisible by 3.
689: 6 + 8 + 9 = 23 23 is not divisible by 3, so 689 is not divisible by 3.
974: 9 + 7 + 4 = 20 20 is not divisible by 3, so 974 is not divisible by 3.
2,032: 2 + 0 + 3 + 2 = 7 7 is not divisible by 3, so 2,032 is not divisible by 3.
Cross off 5, 14, 32, 98, 310, 689, 974, and 2,032.

I am not divisible by 5.
Cross off the numbers that end in 0 or 5. Cross off 5, 310, 585, and 3,825.

I have fewer than four digits.
Cross off the numbers that have four digits. Cross off 1,008, 2,032, and 3,825.

I am not an even number.
Cross off the even numbers. Cross off 6, 14, 32, 84, 98, 310, 462, 756, 974, 1,008, and 2,032.

Two of my digits are the same.
Cross off all numbers that do not have two of the same digit. Cross off all numbers except 117, 393, 585, 1,008, and 2,032.

If you divide my second digit by my first digit, you get my last digit.
Only numbers remaining after all other clues are used are shown below.
117: 1 ÷ 1 = 1 1 is not the last digit. Cross off 117.
393: 9 ÷ 3 = 3 3 is the last digit. The number is 393.



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Review

1. a. 72 + 9 = 81
81 + 9 = 90
90 + 9 = 99
99 + 9 = 108
108 + 9 = 117

72, 81, 90, 99, 108, 117
rule: add 9

b. 156 − 12 = 144
144 − 12 = 132
132 − 12 = 120
120 − 12 = 108
108 − 12 = 96

156, 144, 132, 120, 108, 96
rule: subtract 12

c. 1 × 3 = 3
3 × 3 = 9
9 × 3 = 27
27 × 3 = 81
81 × 3 = 243

1, 3, 9, 27, 81, 243
rule: multiply by 3

2. a.
$$\begin{array}{r} {\scriptstyle 2}\not{5}5 \\ \times\ 48 \\ \hline 440 \\ +\ 2{,}200 \\ \hline 2{,}640 \end{array}$$

b.
$$\begin{array}{r} 25 \\ \hline 7\overline{)175} \\ -14\downarrow \\ \hline 35 \\ -\ 35 \\ \hline 0 \end{array}$$

3. 35

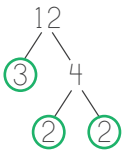
If the number of dragonflies and butterflies are equal, the total number must be even because any number plus itself is the same as that number times 2. The only odd number is 35.

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PRIME FACTORIZATION

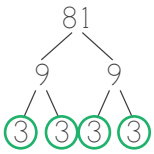
Video Lesson

Left Box



$2 \times 2 \times 3$

Right Box



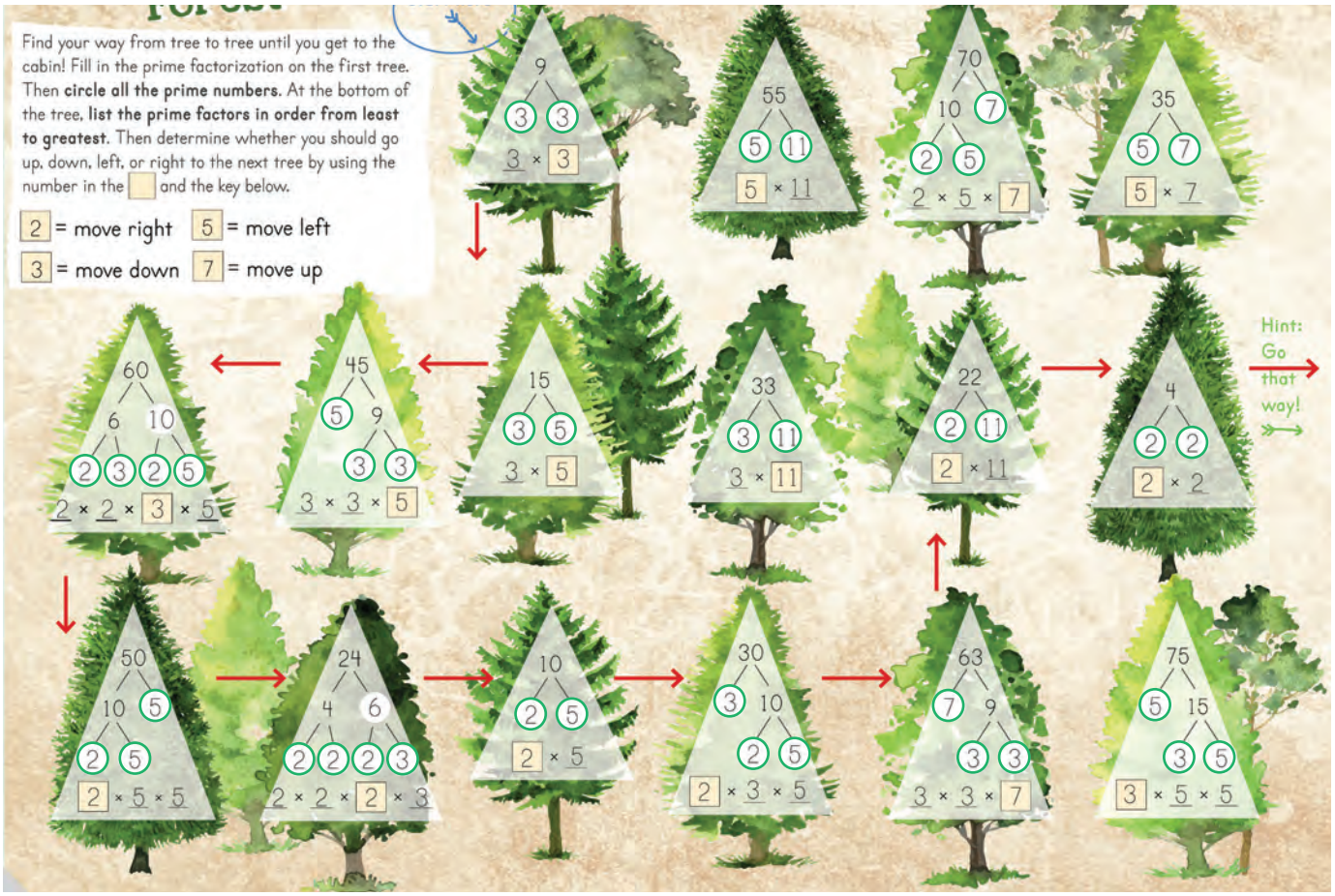
$3 \times 3 \times 3 \times 3$

Practice

The correct path is shown below. The path is found by following this key for the number in the yellow box:

2 = move right 5 = move left
3 = move down 7 = move up

Students only had to complete problems on the path, but all problem answers are shown. Students may have completed extra problems for additional practice.





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EXPONENTS

Video Lesson

Top Box

$7 \times 7 \times 7 = 7^3$

$4^8 = 4 \times 4 \times 4 \times 4 \times 4 \times 4 \times 4 \times 4$

Bottom Box

2^3

two cubed

$2 \times 2 \times 2$

8

Practice

1. a. $10^0 = 1$

b. $10^1 = 10$

c. $10^2 = 10 \times 10 = 100$

d. $10^3 = 10 \times 10 \times 10 = 1{,}000$

e. $10^4 = 10 \times 10 \times 10 \times 10 = 10{,}000$

2. a. $2^3 = 2 \times 2 \times 2 = 8$
$3^2 = 3 \times 3 = 9$

Standard form: $8 + 9$
$8 + 9 = 17$
$2^3 + 3^2 = 17$

b. $7^2 = 7 \times 7 = 49$
$85^0 = 1$

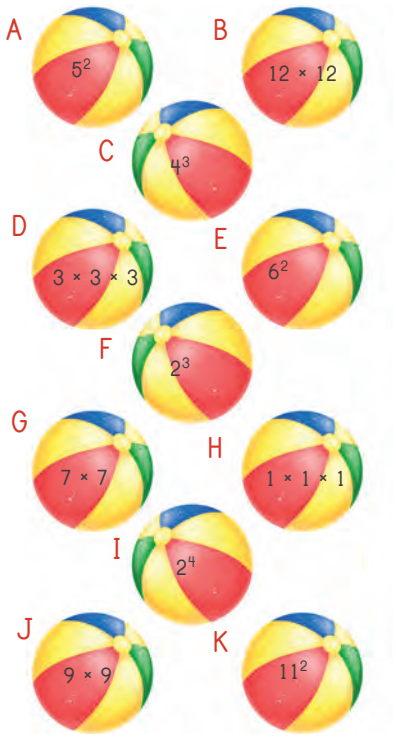
Standard form: $49 + 1$
$49 + 1 = 50$
$7^2 + 85^0 = 50$

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3.

Exponent Form	Word Form	Factored Form	Standard Form
2^5	two to the fifth power	$2 \times 2 \times 2 \times 2 \times 2$	32
5^3	five to the third power or five cubed	$5 \times 5 \times 5$	125
3^4	three to the fourth power	$3 \times 3 \times 3 \times 3$	81
7^3	seven to the third power or seven cubed	$7 \times 7 \times 7$	343
3^2	three to the second power or three squared	3×3	9

4. Work for finding the standard form of each number is shown below.



A $5^2 = 5 \times 5 = 25$

B $12 \times 12 = 144$

C $4^3 = 4 \times 4 \times 4 = 64$

D $3 \times 3 \times 3 = 27$

E $6^2 = 6 \times 6 = 36$

F $2^3 = 2 \times 2 \times 2 = 8$

G $7 \times 7 = 49$

H $1 \times 1 \times 1 = 1$

I $2^4 = 2 \times 2 \times 2 \times 2 = 16$

J $9 \times 9 = 81$

K $11^2 = 11 \times 11 = 121$

Numbers from least to greatest: 1, 8, 16, 25, 27, 36, 49, 64, 81, 121, 144

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Review

1. The number is divisible by 2 because it is even.

4 + 2 + 0 + 4 + 1 + 2 + 3 + 2 + 0 = 18 18 is divisible by 3, so 420,412,320 is divisible by 3.

The number formed by the last two digits (20) is divisible by 4, so 420,412,320 is divisible by 4.

The number is divisible by 5 because it ends in a 0.

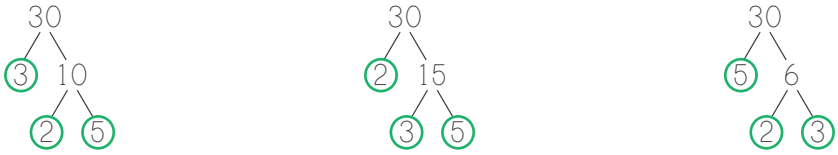
The number is divisible by 6 because it is divisible by both 2 and 3.

The sum of the digits (18) is divisible by 9, so 420,412,320 is divisible by 9.

The number is divisible by 10 because it ends in a 0.

(2) (3) (4) (5) (6) (9) (10)

2. Students only need to show two ways, but three examples are given below.



3. 2 × 3 × 5

4. a.
$$\begin{array}{r} {\scriptstyle 1}\not{4}32 \\ \times\ 14 \\ \hline {\scriptstyle 1}1,728 \\ +\ 4,320 \\ \hline 6,048 \end{array}$$

b.
$$\begin{array}{r|l} & 28 \\ \hline 8 & 224 \\ -\ 16 & \downarrow \\ \hline & 64 \\ -\ 64 & \\ \hline & 0 \end{array}$$

5. a.
$$\begin{array}{r} {\scriptstyle 1\ 1\ 1} \\ 13,086 \\ +\ 47,940 \\ \hline 61,026 \end{array}$$

b.
$$\begin{array}{r} {\scriptstyle 8\ \ 4} \\ 4\not{9}{\scriptstyle 1}2,\not{5}{\scriptstyle 1}31 \\ -\ 179,341 \\ \hline 313,190 \end{array}$$

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MULTIPLYING AND DIVIDING BY POWERS OF 10

Video Lesson

7×10^4
The exponent is 4. Add 4 zeros after 7.
$7 \times 10^4 =$ 70,000

12×10^2
The exponent is 2. Add 2 zeros after 12.
$12 \times 10^2 =$ 1,200

$400{,}000 \div 10^5$
The exponent is 5. Take 5 zeros off of 400,000.
$400{,}000 \div 10^5 =$ 4

Practice

1. a. $34 \times 1 =$ 34 $34 \times 10^0 =$ 34
   b. $34 \times 10 =$ 340 $34 \times 10^1 =$ 340
   c. $34 \times 100 =$ 3,400 $34 \times 10^2 =$ 3,400
   d. $34 \times 1{,}000 =$ 34,000 $34 \times 10^3 =$ 34,000
   e. $34 \times 10{,}000 =$ 340,000 $34 \times 10^4 =$ 340,000

2. a. The exponent is 3. Add 3 zeros after 3.
   $3 \times 10^3 =$ 3,000
   b. The exponent is 4. Add 4 zeros after 255.
   $255 \times 10^4 =$ 2,550,000
   c. The exponent is 5. Add 5 zeros after 54.
   $54 \times 10^5 =$ 5,400,000
   d. The exponent is 0. Do not add any zeros.
   $372 \times 10^0 =$ 372

3. a. The exponent is 2. Take 2 zeros off of 55,000.
   $55{,}000 \div 10^2 =$ 550

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b. The exponent is 4. Take 4 zeros off of 870,000.
$870{,}000 \div 10^4 = 87$

c. The exponent is 3. Take 3 zeros off of 4,000.
$4{,}000 \div 10^3 = 4$

d. The exponent is 0. Do not take off any zeros.
$33{,}000 \div 10^0 = 33{,}000$

4. a. The exponent is 2. Add 2 zeros after 2.
2×10^2 miles = 200 miles

b. The exponent is 2. Add 2 zeros after 3.
3×10^2 miles = 300 miles

5. The exponent is 30. Add 30 zeros after 2.
2×10^{30} kg = 2,000,000,000,000,000,000,000,000,000,000 kg

6. Work for each problem is shown below. The exponent tells how many times to multiply by 10, which is also the number of zeros to add after the number.



A $7 \times 10^2 = 7 \times 10 \times 10 = 700$

B $33 \times 10^3 = 33 \times 10 \times 10 \times 10 = 33{,}000$

C $14 \times 10^4 = 14 \times 10 \times 10 \times 10 \times 10 = 140{,}000$

D $262 \times 10^0 = 262 \times 1 = 262$

E $3{,}590 \times 10^1 = 3{,}590 \times 10 = 35{,}900$

F $10{,}761 \times 10^2 = 10{,}761 \times 10 \times 10 = 1{,}076{,}100$

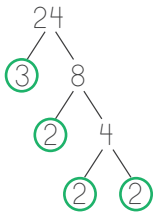
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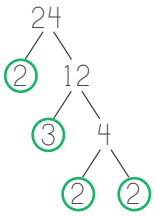
Review

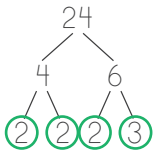
1.

Exponent Form	Factored Form	Standard Form
2^2	2×2	4
3^4	$3 \times 3 \times 3 \times 3$	81
4^4	$4 \times 4 \times 4 \times 4$	256
5^3	$5 \times 5 \times 5$	125
10^4	$10 \times 10 \times 10 \times 10$	10,000

2. Students only need to show two ways, but three examples are given below.







3. 51: 5 + 1 = 6 6 is divisible by 3, so 51 is divisible by 3.
214: 2 + 1 + 4 = 7 7 is not divisible by 3, so 214 is not divisible by 3.
546: 5 + 4 + 6 = 15 15 is divisible by 3, so 546 is divisible by 3.
928: 9 + 2 + 8 = 19 19 is not divisible by 3, so 928 is not divisible by 3.
2,310: 2 + 3 + 1 + 0 = 6 6 is divisible by 3, so 2,310 is divisible by 3.
14,322: 1 + 4 + 3 + 2 + 2 = 12 12 is divisible by 3, so 14,322 is divisible by 3.

51 214 546 928 2,310 14,322

4. 45: 45 ends in 5, so 45 is divisible by 5.
100: 100 ends in 0, so 100 is divisible by 5.
230: 230 ends in 0, so 230 is divisible by 5.
602: 602 does not end in 0 or 5, so 602 is not divisible by 5.
1,715: 1,715 ends in 5, so 1,715 is divisible by 5.
8,011: 8,011 does not end in 0 or 5, so 8,011 is not divisible by 5.

45 100 230 602 1,715 8,011

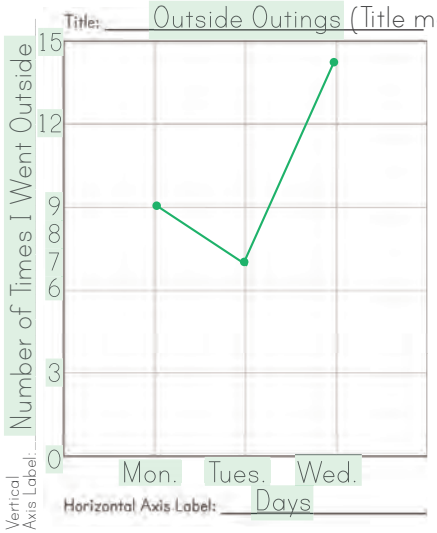
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SINGLE, DOUBLE, AND TRIPLE LINE GRAPHS

Video Lesson

7 miles

4



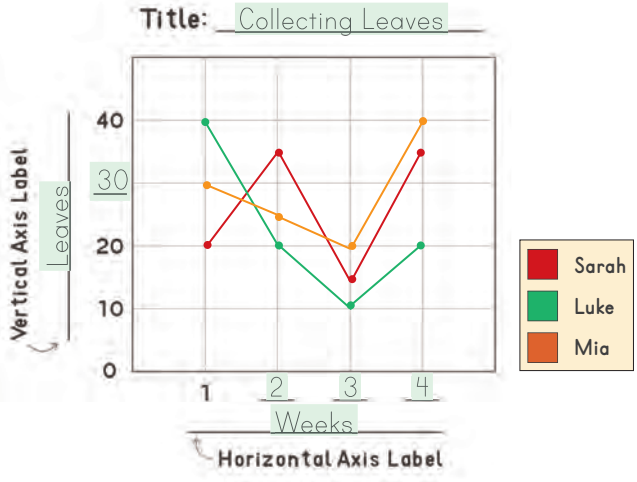
Practice

1. a. pounds

b. 1 pound

c. In April, Pepper weighed 2 pounds. In July, Pepper weighed 8 pounds.
8 − 2 = 6
6 pounds

2. a.–f. Title and colors may vary. An example is given below.



g. Sarah

h. Luke collected 40 leaves in week 1. Mia collected 30 leaves in week 1.
40 − 30 = 10
10 leaves

3. Answers will vary.

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Review

1. a. The exponent is 4. Add 4 zeros after 72.
$72 \times 10^4 =$ 720,000

b. The exponent is 5. Add 5 zeros after 1,180.
$1{,}180 \times 10^5 =$ 118,000,000

2. a. The exponent is 2. Take 2 zeros off of 42,000.
$42{,}000 \div 10^2 =$ 420

b. The exponent is 3. Take 3 zeros off of 5,050,000.
$5{,}050{,}000 \div 10^3 =$ 5,050

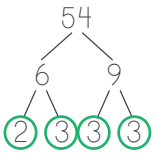
3. a. $5^2 = 5 \times 5 = 25$
$2^4 = 2 \times 2 \times 2 \times 2 = 16$
$25 + 16 = 41$
$5^2 + 2^4 =$ 41

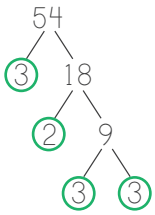
b. $1^8 = 1 \times 1 \times 1 \times 1 \times 1 \times 1 \times 1 \times 1 = 1$
$11^2 = 11 \times 11 = 121$
$1 + 121 = 122$
$1^8 + 11^2 =$ 122

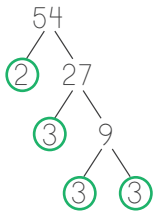
4. a. $7^2 = 7 \times 7 = 49$
$12^0 = 1$
$49 - 1 = 48$
$7^2 - 12^0 =$ 48

b. $8^2 = 8 \times 8 = 64$
$2^3 = 2 \times 2 \times 2 = 8$
$64 - 8 = 56$
$8^2 - 2^3 =$ 56

5. Students only need to show one way, but three examples are given below.





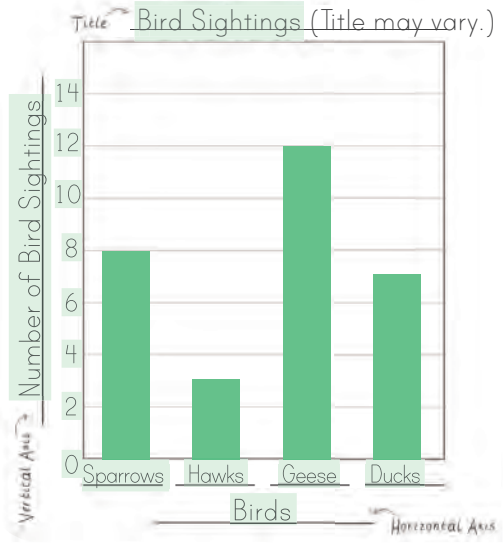


$2 \times 3 \times 3 \times 3$

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BAR GRAPHS AND DOUBLE BAR GRAPHS

Video Lesson



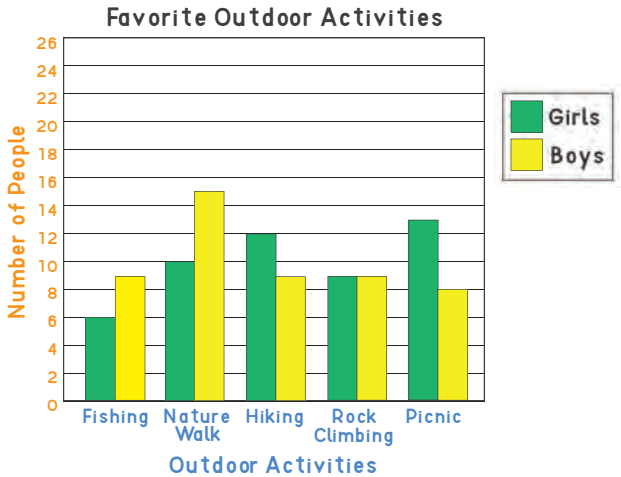
Practice

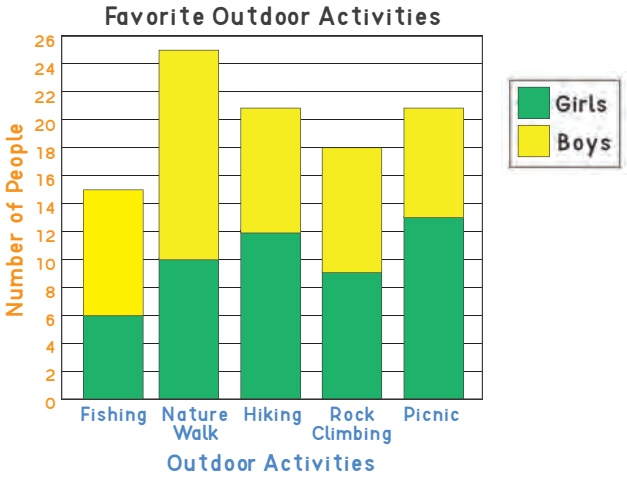
1. a. Nature Walk

   b. 15 people

   c. Hiking and Picnic

   d. 25 people like nature walks.
   15 people like fishing.
   25 − 15 = 10
   10 people

2. 

3. 

4. Answers will vary.

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Review

1. a. 25×1 and 5×5

b. 1×45, 3×15, and 5×9

2. a. $4^2 = 4 \times 4 = 16$
$2^3 = 2 \times 2 \times 2 = 8$
$16 + 8 = 24$
$4^2 + 2^3 = 24$

b. $77^0 = 1$
$12^2 = 12 \times 12 = 144$
$1 + 144 = 145$
$77^0 + 12^2 = 145$

3. 14: 14 is not divisible by 4.
524: 24 is divisible by 4, so 524 is divisible by 4.
8,734: 34 is not divisible by 4, so 8,734 is not divisible by 4.
11,904: 4 is divisible by 4, so 11,904 is divisible by 4.
360,912: 12 is divisible by 4, so 360,912 is divisible by 4.

14 (524) 8,734 (11,904) (360,912)

4. $909 - 101 = 808$
$808 - 101 = 707$
$707 - 101 = 606$
$606 - 101 = 505$
$505 - 101 = 404$
$404 - 101 = 303$

909, 808, 707, 606, 505, 404, 303
rule: subtract 101

5.
$$\begin{array}{r} 701 \\ \times\ 33 \\ \hline 2103 \\ +\ 21030 \\ \hline 23{,}133 \end{array}$$

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FRACTIONS AND PERCENTS

Video Lesson

Left Grid

Fraction: $\frac{34}{100}$

Percent: 34%

Right Grid

Fraction: $\frac{47}{100}$

Percent: 47%

Practice

1. a. fraction: $\frac{80}{100}$

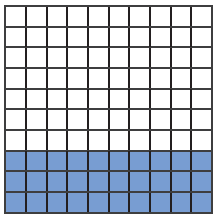
   percent: 80%

   b. fraction: $\frac{4}{100}$

   percent: 4%

   c. fraction: $\frac{55}{100}$

   percent: 55%

2. 

   percent: 30%

3. Toys That Went to Boys

   fraction: $\frac{52}{100}$

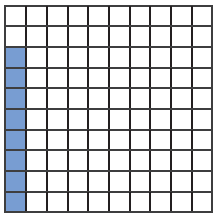
   percent: 52%

   Toys That Went to Girls

   Subtract the number of shaded boxes from 100.
   $100 - 52 = 48$

   fraction: $\frac{48}{100}$

   percent: 48%

4. 

   Clear Marbles

   fraction: $\frac{8}{100}$

   percent: 8%

   Colorful Marbles

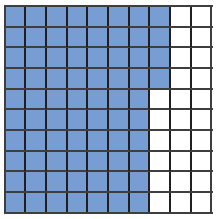
   Subtract the number of shaded boxes from 100.
   $100 - 8 = 92$

   fraction: $\frac{92}{100}$

   percent: 92%

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5.



Kids with Water Bottles

fraction: $\frac{74}{100}$

percent: 74%

Kids without Water Bottles

Subtract the number of shaded boxes from 100.
100 − 74 = 26

fraction: $\frac{26}{100}$

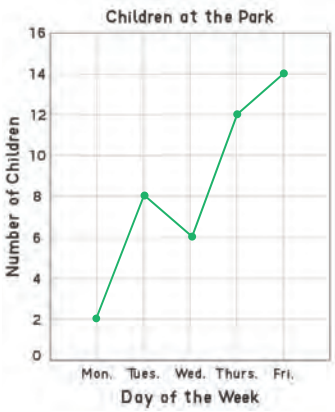
percent: 26%

6.

Cents	Fraction of a Dollar	Percent of a Dollar
7¢	$\frac{7}{100}$	7%
33¢	$\frac{33}{100}$	33%
16¢	$\frac{16}{100}$	16%
99¢	$\frac{99}{100}$	99%
6¢	$\frac{6}{100}$	6%

Review

1.



2. a. The exponent is 4. Add 4 zeros after 44.
$44 \times 10^4 = 440{,}000$

b. The exponent is 3. Take 3 zeros off of 570,000.
$570{,}000 \div 10^3 = 570$

3. 320: 320 ends in 0, so 320 is divisible by 5.
402: 402 does not end in 0 or 5, so 402 is not divisible by 5.
875: 875 ends in 5, so 875 is divisible by 5.
2,635: 2,635 ends in 5, so 2,635 is divisible by 5.
60,236: 60,236 does not end in 0 or 5, so 60,236 is not divisible by 5.
947,035: 947,035 ends in 5, so 947,035 is divisible by 5.

(320) 402 (875) (2,635) 60,236 (947,035)

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4. 36 + 12 = 48
48 + 12 = 60
60 + 12 = 72
72 + 12 = 84
84 + 12 = 96
96 + 12 = 108

36, 48, 60, 72, 84, 96, 108
rule: add 12

5. a. (given)

b. 4^2

c. 8^5

d. 12^4

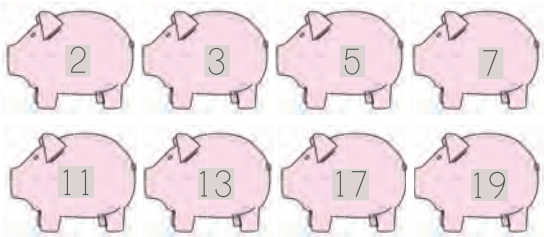
e. 5^3

f. 11^3

6. a.
$$\begin{array}{r} 64 \\ 6\overline{)384} \\ -\,36\downarrow \\ \hline 24 \\ -\,24 \\ \hline 0 \end{array}$$

b.
$$\begin{array}{r} 16 \\ 9\overline{)144} \\ -\,9\downarrow \\ \hline 54 \\ -\,54 \\ \hline 0 \end{array}$$

7.



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LONG DIVISION WITH REMAINDERS: CHECKING DIVISION

Video Lesson

```
  35 R4
7)249
 -21
  39
 -35
   4
```

Practice

1. a.
```
  121 R2
3)365
 -3
  06
 - 6
  05
 - 3
   2
```

b.
```
   213 R6
12)2,562
 -24
   16
 -12
   42
 -36
    6
```

2.
```
  172 R5
3)521
 -3
  22
 -21
   11
  -6
   5
```

```
  173 R2
3)521
 -3
  22
 -21
   11
  -9
   2
```

3.
```
  2
  173
×   3
  519
```

```
  519
+   2
  521
```

4.
```
  13 R1
2)27
 -2
  07
 - 6
   1
```

13 books
Money left over: $1

5. a.
```
   21 R2
6)128
 -12
   08
  - 6
    2
```

21 treats

b. Treats left over: 2

6.
```
  11 R7
8)95
 -8
  15
 - 8
   7
```

a. 11 ears of corn

b. 7 ears of corn

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7. $2\overline{)429}$ 214 R1 $7\overline{)894}$ 127 R3 $3\overline{)962}$ 320 R2

Work for checking each answer is shown below:

$$\begin{array}{r} 214 \\ \times\ \ 2 \\ \hline 428 \end{array} \qquad \begin{array}{r} 428 \\ +\ \ 1 \\ \hline 429 \end{array}$$

This answer is correct.

$$\begin{array}{r} {\scriptstyle 1\ 4} \\ 127 \\ \times\ \ 7 \\ \hline 889 \end{array} \qquad \begin{array}{r} 889 \\ +\ \ 3 \\ \hline 892 \end{array}$$

This answer is incorrect.

$$\begin{array}{r} 320 \\ \times\ \ 3 \\ \hline 960 \end{array} \qquad \begin{array}{r} 960 \\ +\ \ 2 \\ \hline 962 \end{array}$$

This answer is correct.

8. a. $11\overline{)2{,}541}$ 231

-22
34
-33
11
-11
0

b. $9\overline{)315}$ 35

-27
45
-45
0

c. $7\overline{)928}$ 132 R4

-7
22
-21
18
-14
4

Review

1. fraction: $\frac{74}{100}$

percent: 74%

2. a. (given)

b. $4^3 = 4 \times 4 \times 4 = 64$

c. $3^3 = 3 \times 3 \times 3 = 27$

d. $2^4 = 2 \times 2 \times 2 \times 2 = 16$

3. 486:
486 is even, so 486 is divisible by 2. 4 + 8 + 6 = 18 18 is divisible by 3, so 486 is divisible by 3.
486 is divisible by 6 because it is divisible by both 2 and 3.

772:
772 is even, so 772 is divisible by 2. 7 + 7 + 2 = 16 16 is not divisible by 3, so 772 is not divisible by 3.
772 is not divisible by 6 because it is not divisible by 3.

2,886:
2,886 is even, so 2,886 is divisible by 2. 2 + 8 + 8 + 6 = 24 24 is divisible by 3, so 2,886 is divisible by 3.
2,886 is divisible by 6 because it is divisible by both 2 and 3.

5,530:
5,530 is even, so 5,530 is divisible by 2. 5 + 5 + 3 + 0 = 13 13 is not divisible by 3, so 5,530 is not divisible by 3.
5,530 is not divisible by 6 because it is not divisible by 3.

13,823:
13,823 is odd, so 13,823 is not divisible by 2. 1 + 3 + 8 + 2 + 3 = 17 17 is not divisible by 3, so 13,823 is not divisible by 3.
13,823 is not divisible by 6 because it is not divisible by 2 or 3.

(486) 772 (2,886) 5,530 13,823

4.

$$\begin{array}{r} 201 \\ \times\ 34 \\ \hline 804 \\ +6{,}030 \\ \hline 6{,}834 \end{array}$$

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QUOTIENTS WITH ZERO

Video Lesson

$$\begin{array}{r} 507 \\ 5\overline{)2{,}535} \\ -25\downarrow \\ \hline 03\downarrow \\ -\ 0\downarrow \\ \hline 35 \\ -35 \\ \hline 0 \end{array}$$

Practice

1. a.
$$\begin{array}{r} 209 \\ 3\overline{)627} \\ -6\downarrow \\ \hline 02\downarrow \\ -0\downarrow \\ \hline 27 \\ -27 \\ \hline 0 \end{array}$$

b.
$$\begin{array}{r} 101 \\ 55\overline{)5{,}555} \\ -55\downarrow \\ \hline 05\downarrow \\ -\ 0\downarrow \\ \hline 55 \\ -55 \\ \hline 0 \end{array}$$

c.
$$\begin{array}{r} 107 \\ 5\overline{)535} \\ -5\downarrow \\ \hline 03\downarrow \\ -\ 0\downarrow \\ \hline 35 \\ -35 \\ \hline 0 \end{array}$$

d.
$$\begin{array}{r} 206 \\ 4\overline{)824} \\ -8\downarrow \\ \hline 02\downarrow \\ -\ 0\downarrow \\ \hline 24 \\ -24 \\ \hline 0 \end{array}$$

2.
$$\begin{array}{r} 506 \\ 9\overline{)4{,}554} \\ -45\downarrow \\ \hline 05\downarrow \\ -\ 0\downarrow \\ \hline 54 \\ -54 \\ \hline 0 \end{array}$$

Check:

$$\begin{array}{r} {\scriptstyle 5} \\ 506 \\ \times\ \ 9 \\ \hline 4{,}554 \end{array}$$

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3.

```
  108
8)864
 -8
  06
 - 0
  64
 -64
   0
```

108 miles

4.

```
   685
3)2,055
 -18
  25
 -24
   15
  -15
    0
```

685 kilometers

5.

V

```
  403
2)806
 -8
  00
 - 0
   06
  - 6
    0
```

N

```
  690
5)3,450
 -30
   45
  -45
    00
   - 0
     0
```

U

```
  609
9)5,481
 -54
   08
  - 0
    81
   -81
     0
```

S

```
  340
8)2,720
 -24
   32
  -32
    00
   - 0
     0
```

M

```
  310
3)930
 -9
  03
 - 3
   00
  - 0
    0
```

T

```
  790
3)2,370
 -21
   27
  -27
    00
   - 0
     0
```

B

```
  508
7)3,556
 -35
   05
  - 0
    56
   -56
     0
```

R

```
  402
6)2,412
 -24
   01
  - 0
    12
   -12
     0
```


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E
$$\begin{array}{r} 120 \\ 4\overline{)480} \\ -4\downarrow \\ \hline 08 \\ -\ 8\downarrow \\ \hline 00 \\ -\ 0 \\ \hline 0 \end{array}$$

H
$$\begin{array}{r} 209 \\ 9\overline{)1{,}881} \\ -18\downarrow \\ \hline 08 \\ -\ 0\downarrow \\ \hline 81 \\ -81 \\ \hline 0 \end{array}$$

I am an odd number. Take away a letter and I become even. What number am I?

T	H	E	N	U	M	B	E	R
790	209	120	690	609	310	508	120	402

S	E	V	E	N
340	120	403	120	690

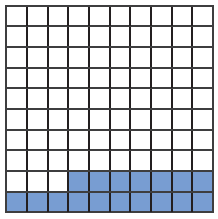
Review

1. 63 + 9 = 72
72 + 9 = 81
81 + 9 = 90
90 + 9 = 99
99 + 9 = 108
108 + 9 = 117

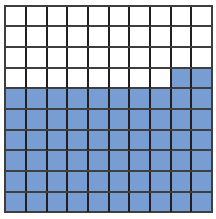
63, 72, 81, 90, 99, 108, 117
rule: add 9

2. Odd
99

3. a.



b.



4. a. The exponent is 5. Take 5 zeros off of 39,000,000,000.
$39{,}000{,}000{,}000 \div 10^5 = 390{,}000$

b. The exponent is 4. Add 4 zeros after 618.
$618 \times 10^4 = 6{,}180{,}000$

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SHORT DIVISION

Video Lesson

$6\overline{)3{,}660}$ = 610

$8\overline{)52^{4}0}$ = 65

$3\overline{)5^{2}5}$ = 18 R1

Practice

1. a. $3\overline{)123}$ = 41

b. $8\overline{)816}$ = 102

c. $6\overline{)1{,}7^{5}40}$ = 290

d. $8\overline{)2{,}488}$ = 311

2. $7\overline{)350}$ = 50

50 rows of teeth

3. $6\overline{)8^{2}1^{3}0}$ = 135

Check: $\begin{array}{r} {}^{2}\,{}^{3}\,\\ 135\\ \times\ \ 6\\ \hline 810 \end{array}$

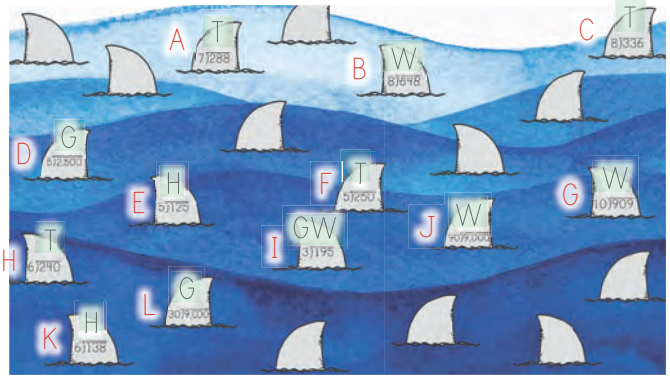
135 pups

4. a. $4\overline{)5^{1}5}$ = 13 R3

b. $7\overline{)750}$ = 107 R1

c. $5\overline{)1{,}6^{1}02}$ = 320 R2

Fins & Facts



Work for each problem is shown below.

A $7\overline{)288}$ = 41 R1

T

B $8\overline{)648}$ = 81

W

C $8\overline{)33^{1}6}$ = 42

T

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D $5\overline{)2{,}500}$ $= 500$

This answer is not on the chart. One of the blank numbers is 500.

G

E $5\overline{)12^{2}5}$ $= 25$

H

F $5\overline{)250}$ $= 50$

T

G $10\overline{)909}$ $= 90$ R9

W

H $6\overline{)240}$ $= 40$

T

I $3\overline{)19^{1}5}$ $= 65$

GW

J $90\overline{)9{,}000}$ $= 100$

W

K $6\overline{)13^{1}8}$ $= 23$

H

L $30\overline{)9{,}000}$ $= 300$

This answer is not on the chart. One of the blank numbers is 300.

G

300–500 years Greenland

ORDER OF OPERATIONS WITH EXPONENTS

Video Lesson

Top Box

$10 - 2 \times 3 + 2 =$
$10 - 6 + 2 =$
$4 + 2 =$
6

Bottom Box

$50 \div (10 - 5) + 3 \times 2^2 =$
$50 \div 5 + 3 \times 2^2 =$
$50 \div 5 + 3 \times 4 =$
$10 + 12 =$
22

Practice

1.

Recipe

1. parentheses
2. exponents
3. multiplication & division
4. addition & subtraction

2. a. $2 \times \$5 + 3 \times \$8 =$
$\$10 + \$24 =$
$\$34$

b. $2 \times \$20 - \$34 =$
$\$40 - \$34 =$
$\$6$

3. a. $3 \times (15 - 7) =$
$3 \times 8 =$
24

b. $(7 + 2) - 3 \times 2 =$
$9 - 3 \times 2 =$
$9 - 6 =$
3

c. $(8 \times 2) + 2^3 - 4 =$
$16 + 2^3 - 4 =$
$16 + 8 - 4 =$
$24 - 4 =$
20

d. $38 - 5 \times 6 - 2^3 =$
$38 - 5 \times 6 - 8 =$
$38 - 30 - 8 =$
$8 - 8 =$
0

e. $9 - 3 + (6 \times 2) =$
$9 - 3 + 12 =$
$6 + 12 =$
18

4. a. $5 + (4 \times 3) + 12 =$
$5 + 12 + 12 =$
$17 + 12 =$
29

b. $6^2 + 10 \div 2 =$
$36 + 10 \div 2 =$
$36 + 5 =$
41

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c. $(64 \div 8) \times 2 - 8 =$
$8 \times 2 - 8 =$
$16 - 8 =$
8

d. $4 \times 3 - 6 =$
$12 - 6 =$
6

e. $4^2 + 10 \div 2 =$
$16 + 10 \div 2 =$
$16 + 5 =$
21

f. $(20 \div 2) \div 2 + 5 =$
$10 \div 2 + 5 =$
$5 + 5 =$
10

Review

1. a. $5\overline{)27^{2}5}$ → 55

b. $3\overline{)6,905}$ → $2,301\ R2$

c. $12\overline{)4,849}$ → $404\ R1$

2. The number is divisible by 2 because it is even.

$2 + 8 + 8 = 18$ 18 is divisible by 3, so 288 is divisible by 3.

The number formed by the last two digits (88) is divisible by 4, so 288 is divisible by 4.

The number is not divisible by 5 because it does not end in a 0 or 5.

The number is divisible by 6 because it is divisible by both 2 and 3.

The number is not divisible by 10 because it does not end in a 0.

(2) (3) (4) 5 (6) 10

3. 999

4. 11

MULTIPLICATION PROPERTIES AND MISSING NUMBERS

Video Lesson

Top Problem

Multiplication facts:

11 × 7 = 77

K = 7

Bottom Problem

Inverse operation:

57 ÷ 3 = B

$$\begin{array}{r} 19 \\ 3\overline{)57} \\ -\,3 \\ \hline 27 \\ -\,27 \\ \hline 0 \end{array}$$

B = 19

Practice

1. a. 5 × 6 × 2 =
30 × 2 =
60

b. 7 × 10 × 8 =
7 × 8 × 10 =
56 × 10 =
560

c. 3 × 11 × 3 =
3 × 3 × 11 =
9 × 11 =
99

d. 4 × 3 × 6 =
12 × 6 =
72

e. 5 × 47 × 2 =
5 × 2 × 47 =
10 × 47 =
470

f. 13 × 4 × 0 =
13 × 0 =
0

2. Different strategies may be used to find the missing factor. A sample strategy is shown for each problem below.

a. Array/picture:



15 arranged into 5 groups of 3
A = 3

b. Multiplication facts:
5 × 9 = 45
B = 5

c. Inverse operation:
56 ÷ 7 = C
C = 8

d. Skip counting:
6, 12, 18, 24, 30, 36, 42, 48, 54
D = 9

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3. Any variable and solving method can be used.

a. $8 \times B = 32$

Skip counting:

8, 16, 24, 32

$B = 4$

b. $4 \times N = 52$

Inverse operation:

$52 \div 4 = N$

$$4\overline{)52} \quad 13$$

$N = 13$

4. Any solving method can be used. The problems below are solved using the inverse operation.

$2Z = 18$
$18 \div 2 = Z$
$Z = 9$

$3S = 33$
$33 \div 3 = S$
$S = 11$

$8T = 40$
$40 \div 8 = T$
$T = 5$

$4R = 32$
$32 \div 4 = R$
$R = 8$

$6M = 24$
$24 \div 6 = M$
$M = 4$

$4B = 48$
$48 \div 4 = B$
$B = 12$

$5K = 35$
$35 \div 5 = K$
$K = 7$

$7H = 49$
$49 \div 7 = H$
$H = 7$

$7Q = 21$
$21 \div 7 = Q$
$Q = 3$

$5A = 100$
$100 \div 5 = A$

$$5\overline{)100} \quad 20$$

$A = 20$

$9V = 909$
$909 \div 9 = V$

$$9\overline{)909} \quad 101$$

$V = 101$

$8W = 816$
$816 \div 8 = W$

$$8\overline{)816} \quad 102$$

$W = 102$

$11X = 1{,}111$
$1{,}111 \div 11 = X$

$$11\overline{)1{,}111} \quad 101$$

$X = 101$

$7Y = 217$
$217 \div 7 = Y$

$$7\overline{)217} \quad 31$$

$Y = 31$

$6E = 108$
$108 \div 6 = E$

$$6\overline{)108} \quad 18$$

$E = 18$

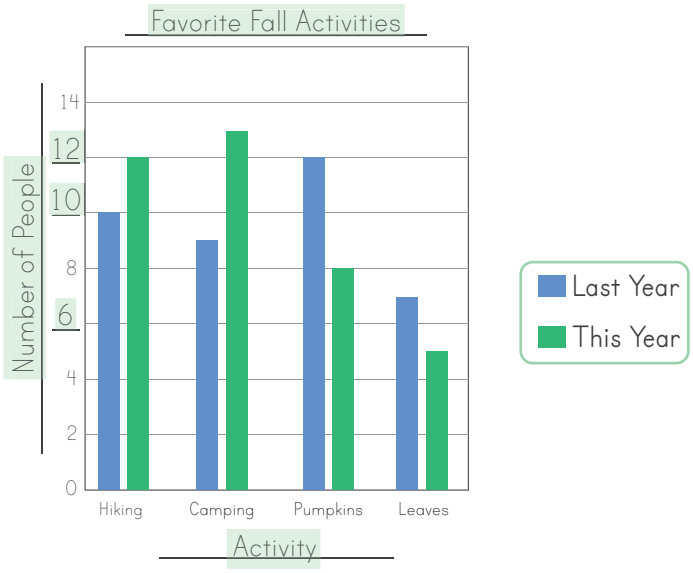
What is the most popular flavor of jam?

S	T	R	A	W	B	E	R	R	Y
11	5	8	20	102	12	18	8	8	31

Review

1. a. $5^2 - (8 - 3) =$
   $5^2 - 5 =$
   $25 - 5 =$
   20

   b. $20 - (5 \times 3) + 4^2 =$
   $20 - 15 + 4^2 =$
   $20 - 15 + 16 =$
   $5 + 16 =$
   21

2. 

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PERFECT SQUARES TO 144

Video Lesson

Top Box

$1^2 = 1$
$2^2 = 4$
$3^2 = 9$
$4^2 = 16$
$5^2 = 25$
$6^2 = 36$
$7^2 = 49$
$8^2 = 64$
$9^2 = 81$
$10^2 = 100$
$11^2 = 121$
$12^2 = 144$

1, 4, 9, 16, 25, 36, 49, 64, 81, 100, 121, 144

Bottom Box

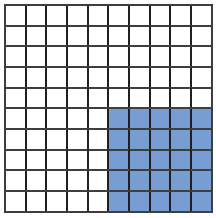
5: There are no whole numbers that can be squared to equal 5.
9: $3^2 = 9$
16: $4^2 = 16$
22: There are no whole numbers that can be squared to equal 22.
36: $6^2 = 36$

~~1~~, 9, 16, ~~22~~, 36

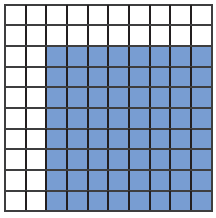
Practice

1. a. (given)

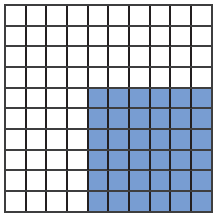
b.



c.



d.



2. a. 9 100 25 (44) 36

b. 16 1 (200) 81 4

c. 121 9 100 144 (27)

d. 4 (40) 64 25 81

3. a. 4

b. 25

c. 64

d. 121

4. 1, 4, 9, 16, 25, 36, 49, 64, 81, 100, 121, 144

5. a. $3^2 = 9$

b. $1^2 = 1$

c. $4^2 = 16$

d. $2^2 = 4$

e. $5^2 = 25$

f. $8^2 = 64$

g. $6^2 = 36$

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h. $7^2 = 49$

i. $9^2 = 81$

j. $11^2 = 121$

k. $10^2 = 100$

l. $12^2 = 144$

6. The area of a square is side × side, or side^2. Square the side length to find the area.

$5^2 = 25$

25 square feet

Review

1. a. $54 \div 6 = Q$
$Q = 9$

b. $36 \div 9 = R$
$R = 4$

c. $200 \div 20 = S$
$S = 10$

2. a. $2^3 + (12 - 8) \div 2 =$
$2^3 + 4 \div 2 =$
$8 + 4 \div 2 =$
$8 + 2 =$
10

b. $24 - 8 \times 2 + 6 =$
$24 - 16 + 6 =$
$8 + 6 =$
14

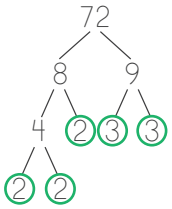
3. a. $7\overline{)3{,}528}$ = 504

b. $8\overline{)4{,}9^{1}8^{2}7}$ = 623 R3

4.

Cents	Fraction of a Dollar	Percent of a Dollar
7¢	$\frac{7}{100}$	7%
25¢	$\frac{25}{100}$	25%
14¢	$\frac{14}{100}$	14%
89¢	$\frac{89}{100}$	89%

5. Different factors could have been chosen for the first branches. An example is shown below.



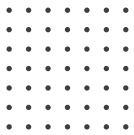
$2 \times 2 \times 2 \times 3 \times 3$

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SQUARE ROOTS

Video Lesson

Top Box



$\sqrt{49} = 7$

Bottom Box

$\sqrt{81} + \sqrt{4} =$
$9 + 2 =$
11

Practice

1.

a. $\sqrt{25} = 5$

b. $\sqrt{64} = 8$

c. $\sqrt{4} = 2$

d. $\sqrt{9} = 3$

e. $\sqrt{1} = 1$

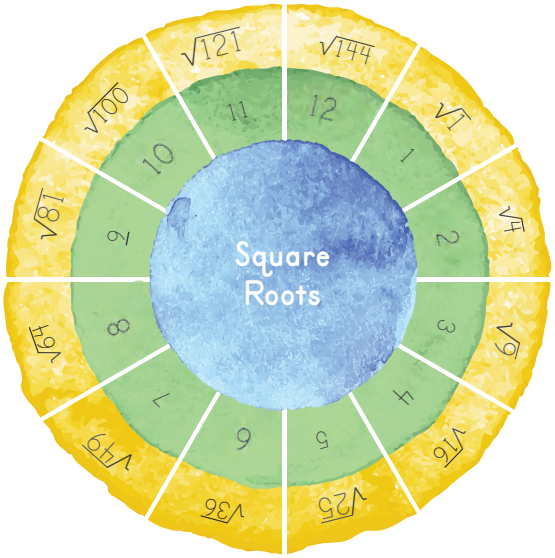
f. $\sqrt{36} = 6$

g. $\sqrt{100} = 10$

h. $\sqrt{81} = 9$

i. $\sqrt{121} = 11$

2.



3.

a. $\sqrt{4} = 2$
$2 + 2 = 4$
$\sqrt{4} + \sqrt{4} = 4$

b. $\sqrt{16} = 4$
$4 + 4 = 8$
$\sqrt{16} + \sqrt{16} = 8$

c. $\sqrt{36} = 6$
$\sqrt{4} = 2$
$6 + 2 = 8$
$\sqrt{36} + \sqrt{4} = 8$

d. $\sqrt{81} = 9$
$\sqrt{9} = 3$
$9 + 3 = 12$
$\sqrt{81} + \sqrt{9} = 12$

e. $\sqrt{121} = 11$
$\sqrt{64} = 8$
$11 + 8 = 19$
$\sqrt{121} + \sqrt{64} = 19$

f. $\sqrt{49} = 7$
$\sqrt{1} = 1$
$7 + 1 = 8$
$\sqrt{49} + \sqrt{1} = 8$

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4. a. area of a square = side^2
Each side will be the square root of the area.
$\sqrt{25} = 5$

5 feet

b. area of a square = side^2
Each side will be the square root of the area.
$\sqrt{64} = 8$

8 inches

c. area of a square = side^2
Each side will be the square root of the area.
$\sqrt{36} = 6$

6 inches

d. area of a square = side^2
Each side will be the square root of the area.
$\sqrt{144} = 12$

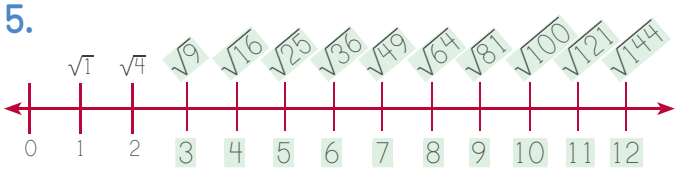
12 miles

e. The number of marbles in each row multiplied by the number of marbles in each column is 121. Because the marbles are arranged in a square, the number of marbles in each row will be the square root of 121.

$\sqrt{121} = 11$

11 marbles

5.



Review

1. a. $10 \times 2 \times 5 =$
$10 \times 10 =$
100

b. $7 \times 3 \times 2 =$
$7 \times 6 =$
42

c. $9 \times 3 \times 4 =$
$9 \times 12 =$
108

2. $1 \times 63, 3 \times 21, 7 \times 9$ 1, 3, 7, 9, 21, 63

3. 1, 4, 9, 16, 25, 36, 49, 64, 81, 100, 121, 144

4. (5) 16 (7) (2) (11) 9 21 (37) (19) (41) 39

5. a. The exponent is 3. Add 3 zeros after 50.
$50 \times 10^3 = 50{,}000$

b. The exponent is 1. Take 1 zero off of 86,000.
$86{,}000 \div 10^1 = 8{,}600$

6. a. $2^5 = 2 \times 2 \times 2 \times 2 \times 2 = 32$

b. $5^3 = 5 \times 5 \times 5 = 125$

c. $6^2 = 6 \times 6 = 36$

d. $10^3 = 10 \times 10 \times 10 = 1{,}000$

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FINDING THE MEAN

Video Lesson

130 + 90 + 85 + 115 + 80 = 500
There are 5 numbers.
mean: 500 ÷ 5 = 100

Practice

1. a. 2 + 1 + 3 = 6
There are 3 numbers.
mean: 6 ÷ 3 = 2

b. 10 + 2 + 0 + 20 = 32
There are 4 numbers.
mean: 32 ÷ 4 = 8

c. 2 + 5 + 4 + 4 + 5 = 20
There are 5 numbers.
mean: 20 ÷ 5 = 4

2. a. 2 + 0 + 1 + 4 + 3 = 10
There are 5 numbers.
mean: 10 ÷ 5 = 2

2 goals

b. 4 + 6 + 3 + 7 = 20
There are 4 numbers.
mean: 20 ÷ 4 = 5

5 points

c. 49 + 50 + 48 + 47 + 56 = 250
There are 5 numbers.
mean: 250 ÷ 5 = 50

50 seconds

d. 8 + 9 + 10 + 9 = 36
There are 4 numbers.
mean: 36 ÷ 4 = 9

9 points

3. a. 4 + 9 + 5 = 18
There are 3 numbers.
mean: 18 ÷ 3 = 6

10 + 5 + 3 = 18
There are 3 numbers.
mean: 18 ÷ 3 = 6

6 = 6

b. 6 + 4 + 5 + 1 = 16
There are 4 numbers.
mean: 16 ÷ 4 = 4

4 + 8 + 0 + 8 = 20
There are 4 numbers.
mean: 20 ÷ 4 = 5

4 < 5

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4. a. $10 + 7 + 4 + 6 + 7 + 2 + 9 + 3 = 48$
There are 8 numbers.
mean: $48 \div 8 = 6$
6 points

b. $6 + 4 + 7 + 12 + 6 + 10 + 3 + 8 = 56$
There are 8 numbers.
mean: $56 \div 8 = 7$
7 points

c. Thunder

Review

1. a.
$$\begin{array}{r} 307\ R1 \\ 2\overline{)615} \\ -6 \\ \hline 01 \\ -\ 0 \\ \hline 15 \\ -14 \\ \hline 1 \end{array}$$

b.
$$\begin{array}{r} 109\ R3 \\ 5\overline{)548} \\ -5 \\ \hline 04 \\ -\ 0 \\ \hline 48 \\ -45 \\ \hline 3 \end{array}$$

2. a. $4\overline{)6^{2}4}$ 16

b. $8\overline{)9^{1}8^{2}4}$ 123

c. $2\overline{)68}$ 34

3. area of a square = side^2
Each side will be the square root of the area.
$\sqrt{25} = 5$
5 feet

4. $16 \div 4^2 + 5 \times 3 - 1 =$
$16 \div 16 + 5 \times 3 - 1 =$
$1 + 15 - 1 =$
$16 - 1 =$
15

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MEDIAN, MODE, AND RANGE

Video Lesson

least to greatest: 2, 2, 3, 5, 6, 9

Median

2, 2, 3, 5, 6, 9
3 + 5 = 8
There are 2 numbers.
8 ÷ 2 = 4

median: 4

Mode

2, 2, 3, 5, 6, 9

mode: 2

Range

2, 2, 3, 5, 6, 9
9 − 2 = 7

range: 7

Practice

1.

Data Set	Median
4, 2, 5, 7, 1 least to greatest: 1, 2, 4, 5, 7	4
10, 14, 10, 15 least to greatest: 10, 10, 14, 15 10 + 14 = 24 There are 2 numbers. 24 ÷ 2 = 12	12
241, 692, 554, 393, 486 least to greatest: 241, 393, 486, 554, 692	486

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2.

Data Set	Mode
2, 7, 5, 4, 2, 6 least to greatest: 2, 2, 4, 5, 6, 7	2
8, 9, 11, 5, 11, 4, 9 least to greatest: 4, 5, 8, 9, 9, 11, 11	9 and 11
449, 448, 444, 448, 450 least to greatest: 444, 448, 448, 449, 450	448

3.

Data Set	Range
3, 4, 1, 5, 10 least to greatest: 1, 3, 4, 5, 10 10 − 1 = 9	9
26, 25, 33, 14, 55 least to greatest: 14, 25, 26, 33, 55 55 − 14 = 41	41
524, 610, 173, 774, 921 least to greatest: 173, 524, 610, 774, 921 921 − 173 = 748	748

4. Hey, diddle diddle, the median's the middle.
You add then divide for the mean.
The mode is the one that you see the most,
And the range is the difference between.

5. least to greatest: 38, 38, 40, 44, 50

38, 38, 40, 44, 50

median: 40

38, 38, 40, 44, 50

mode: 38

38, 38, 40, 44, 50
50 − 38 = 12

range: 12

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6. least to greatest: 3, 8, 10, 14, 18, 24, 32, 40, 51

3, 8, 10, 14, 18, 24, 32, 40, 51

median: 18

3, 8, 10, 14, 18, 24, 32, 40, 51

mode: no mode

3, 8, 10, 14, 18, 24, 32, 40, 51
51 − 3 = 48

range: 48

7. least to greatest: 6, 7, 9, 9, 11, 12, 13, 14

6, 7, 9, 9, 11, 12, 13, 14
9 + 11 = 20
There are 2 numbers.
20 ÷ 2 = 10

median: 10

6, 7, 9, 9, 11, 12, 13, 14

mode: 9

6, 7, 9, 9, 11, 12, 13, 14
14 − 6 = 8

range: 8

Review

1. a.
$$\begin{array}{r} 296 \\ 3\overline{)888} \\ -\,6 \\ \hline 28 \\ -\,27 \\ \hline 18 \\ -\,18 \\ \hline 0 \end{array}$$

b.
$$\begin{array}{r} 88 \\ 6\overline{)528} \\ -\,48 \\ \hline 48 \\ -\,48 \\ \hline 0 \end{array}$$

2. 1, 4, 9, 16, 25, 36, 49, 64, 81, 100, 121, 144

3. a. $\sqrt{36} = 6$

b. $\sqrt{100} = 10$

c. $\sqrt{81} = 9$

d. $\sqrt{4} = 2$

e. $\sqrt{25} = 5$

f. $\sqrt{16} = 4$

g. $\sqrt{121} = 11$

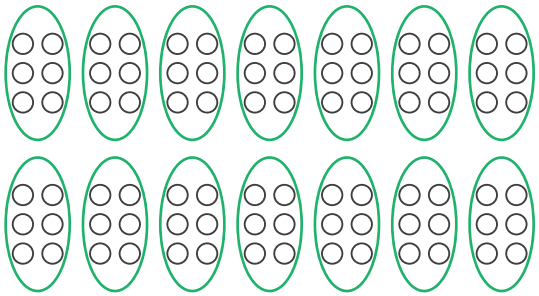
h. $\sqrt{64} = 8$

4. Different strategies may be used to find the missing factor. A sample strategy is shown for each problem below.

a. Skip counting:
20, 40, 60, 80, 100, 120, 140, 160, 180, 200, 220, 240, 260, 280, 300, 320, 340, 360, 380, 400
M = 20

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b. Array/picture:



84 arranged in 14 groups of 6
N = 6

5. a. 5 × 6 × 4 =
5 × 4 × 6 =
20 × 6 =
120

b. 9 × 3 × 4 =
9 × 12 =
108

6. The number is divisible by 2 because it is even.

8 + 3 + 4 + 2 + 9 + 0 + 1 + 0 + 5 + 0 = 32 32 is not divisible by 3, so 8,342,901,050 is not divisible by 3.

The number formed by the last two digits (50) is not divisible by 4, so 8,342,901,050 is not divisible by 4.

The number is divisible by 5 because it ends in a 0.

The number is not divisible by 6 because it is not divisible by both 2 and 3.

The sum of the digits (32) is not divisible by 9, so 8,342,901,050 is not divisible by 9.

The number is divisible by 10 because it ends in a 0.

(2) 3 4 (5) 6 9 (10)

ESTIMATING PRODUCTS AND QUOTIENTS USING AREA

Video Lesson

Top Box

86 rounds to ⟶ 90
45 rounds to ⟶ 50

area = 86 × 45
≈ 90 × 50
≈ 4,500 sq in

Bottom Box

891 rounds to ⟶ 900
33 rounds to ⟶ 30

width = 891 ÷ 33
≈ 900 ÷ 30
≈ 30 m

Practice

1. Answers may vary if students rounded the numbers differently.

a. (given)

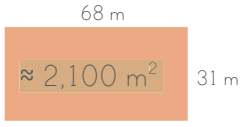
b. 123 ft rounds to ⟶ 120 ft
9 ft rounds to ⟶ 10 ft

120 ft × 10 ft = 1,200 ft²



c. 68 m rounds to ⟶ 70 m
31 m rounds to ⟶ 30 m

70 m × 30 m = 2,100 m²



d. 27 mm rounds to ⟶ 30 mm

30 mm × 30 mm = 900 mm²



2. Answers may vary if students rounded the numbers differently.

100 m × 50 m = 5,000 m²

estimated area: 5,000 m²

3. Answers may vary if students rounded the numbers differently.

a. (given)

b. 198 in² rounds to ⟶ 200 in²
22 in rounds to ⟶ 20 in

$20\overline{)200}$ = 10

estimated width: 10 in

c. 576 cm² rounds to ⟶ 600 cm²
18 cm rounds to ⟶ 20 cm

$20\overline{)600}$ = 30

estimated width: 30 cm

d. 252 m² rounds to ⟶ 250 m²
12 m rounds to ⟶ 10 m

$10\overline{)250}$ = 25

estimated width: 25 m

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4. a. 72 in rounds to ⟶ 70 in
70 in × 70 in = 4,900 in^2

estimated area: 4,900 in^2

b. 27 ft rounds to ⟶ 30 ft
30 ft × 30 ft = 900 ft^2

estimated area: 900 ft^2

5. Answers will vary.

Review

1. least to greatest: 1, 2, 3, 3, 4, 5

1 + 2 + 3 + 3 + 4 + 5 = 18
There are 6 numbers.
18 ÷ 6 = 3

mean: 3

1, 2, (3, 3), 4, 5
3 + 3 = 6
There are 2 numbers.
6 ÷ 2 = 3

median: 3

1, 2, (3, 3), 4, 5

mode: 3

(1), 2, 3, 3, 4, (5)
5 − 1 = 4

range: 4

2. a. $3^2 = 3 \times 3 = 9$
$4^2 = 4 \times 4 = 16$
$2^2 = 2 \times 2 = 4$
$5^2 = 5 \times 5 = 25$
$7^2 = 7 \times 7 = 49$

b. $\sqrt{9} = 3$
$\sqrt{144} = 12$
$\sqrt{1} = 1$
$\sqrt{49} = 7$

3.
$$\begin{array}{r} {}^{5}\not{6},{}^{14}\not{5}{}^{11}\not{2}{}^{13}\not{4},{}^{1}7{}^{3}\not{4}0 \\ -\ 3,5\,3\,4,8\,0\,2 \\ \hline 2,9\,8\,9,9\,3\,8 \end{array}$$

4. Different strategies may be used to find the missing factor. A sample strategy is shown for each problem below.

a. Multiplication facts:
12 × 5 = 60
J = 5

b. Inverse operation: 138 ÷ 6 = K

$$6\overline{)13^{1}8}\ \ 23$$

K = 23

c. Skip counting:
13, 26
L = 2

PERFECT SQUARES TO 225 AND LOGIC GAME

Practice

$4^2 = 16$ | $\sqrt{9} = 3$ | $5^2 = 25$ | $\sqrt{36} = 6$

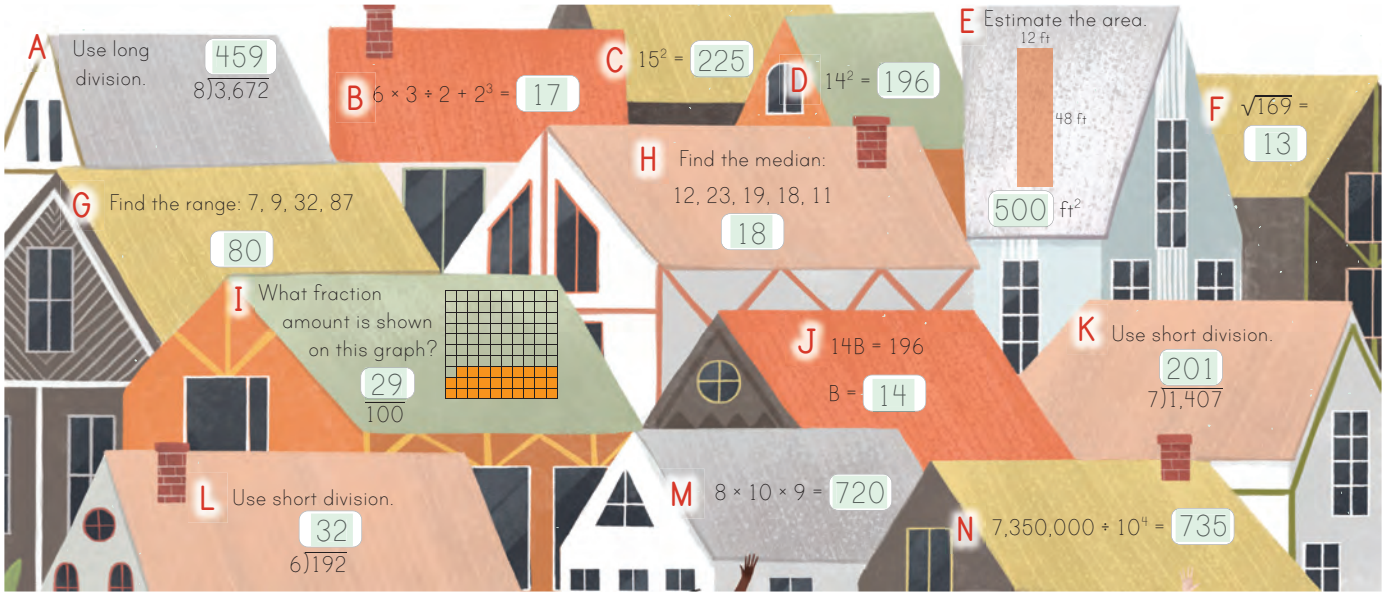
$2^2 = 4$ | $\sqrt{81} = 9$ | $7^2 = 49$ | $\sqrt{100} = 10$

$11^2 = 121$ | $13^2 = 169$ | $\sqrt{64} = 8$ | $\sqrt{49} = 7$

$3^2 = 9$ | $\sqrt{1} = 1$ | $12^2 = 144$ | $\sqrt{196} = 14$

$15^2 = 225$ | $\sqrt{169} = 13$ | $\sqrt{225} = 15$ | $\sqrt{144} = 12$

Number Neighborhood



Work for each problem is shown on the next page.

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A
$$\begin{array}{r} 459 \\ 8\overline{)3,672} \\ -32 \\ \hline 47 \\ -40 \\ \hline 72 \\ -72 \\ \hline 0 \end{array}$$

B $6 \times 3 \div 2 + 2^3 =$
$6 \times 3 \div 2 + 8 =$
$18 \div 2 + 8 =$
$9 + 8 =$
17

C $15^2 = 15 \times 15 = 225$

D $14^2 = 14 \times 14 = 196$

E 12 ft rounds to ⟶ 10 ft
48 ft rounds to ⟶ 50 ft

$10 \text{ ft} \times 50 \text{ ft} = 500 \text{ ft}^2$

F $\sqrt{169} = 13$

G 7, 9, 32, 87
$87 - 7 = 80$
range: 80

H least to greatest:
11, 12, 18, 19, 23
median: 18

I $\frac{29}{100}$

J Inverse operation: $196 \div 14 = B$

$$\begin{array}{r} 14 \\ 14\overline{)196} \\ -14 \\ \hline 56 \\ -56 \\ \hline 0 \end{array}$$

$B = 14$

K
$$\begin{array}{r} 201 \\ 7\overline{)1,407} \end{array}$$

L
$$\begin{array}{r} 32 \\ 6\overline{)19^{1}2} \end{array}$$

M $8 \times 10 \times 9 =$
$8 \times 9 \times 10 =$
$72 \times 10 =$
720

N The exponent is 4. Take 4 zeros off of 7,350,000.
$7{,}350{,}000 \div 10^4 = 735$

House numbers:
13, 14, 17, 18, 29, 32, 80, 196, 201, 225, 459, 500, 720, 735

Clues:

☑ Mia's address is divisible by 5.
This is given on the chart.

☑ McKay's address is divisible by 6.
18 is divisible by both 2 and 3, so 18 is divisible by 6. 720 is divisible by both 2 and 3, so 720 is divisible by 6. Write 18 and 720 in McKay's row.

☑ Heidi's address is divisible by 10.
80, 500, and 720 all end in a 0, so they are all divisible by 10. Write 80, 500, and 720 in Heidi's row.

☑ Grayson's address is divisible by 4.
32 and 80 are divisible by 4. 196 is divisible by 4 because the last two digits (96) are divisible by 4. 500 is divisible by 4 because the last two digits (00) are divisible by 4. 720 is divisible by 4 because the last two digits (20) are divisible by 4. Write 32, 80, 196, 500, and 720 in Grayson's row.

☑ Sawyer's address is odd and greater than 100.
201, 225, 459, and 735 are odd and greater than 100. Write 201, 225, 459, and 735 in Sawyer's row.

☑ Elijah's address is a two-digit prime number.
13, 17, and 29 are two-digit prime numbers. Write 13, 17, and 29 in Elijah's row.

☑ If you multiply the digits of Domenic's address, the product is 0.
For a product to be 0, at least one of the digits must be 0. 80, 201, 500, and 720 all have 0 as a digit. Write 80, 201, 500, and 720 in Domenic's row.

☑ Mia's address is 15 squared.
$15 \times 15 = 225$. Circle 225 in Mia's row.

☑ Elijah's address is greater than 4^2 and less than 3^3.
$4^2 = 4 \times 4 = 16$ and $3^3 = 3 \times 3 \times 3 = 27$. 17 is greater than 16 and less than 27. Circle 17 in Elijah's row.

☑ If you multiply the digits of Grayson's address, the product is greater than 2 and less than 10.
80, 500, and 720 have 0 as a digit, so the product of their digits is 0, which is not greater than 2. For 32, $3 \times 2 = 6$, and for 196, $1 \times 9 \times 6 = 54$. The product of the digits of 32 is 6, which is greater than 2 and less than 10. Circle 32 in Grayson's row.

☑ McKay's address is less than the quotient of $5{,}000 \div 10^2$.
The exponent is 2. Take 2 zeros off of 5,000. $5{,}000 \div 10^2 = 50$. 18 is less than 50. Circle 18 in McKay's row.

☑ Heidi's address is divisible by 8 and greater than 100.
80 is not greater than 100. 500 is not divisible by 8. 720 is divisible by 8 and is greater than 100. Circle 720 in Heidi's row.

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☑ Domenic's address is less than the sum of $4^2 + 5^2 + 6^2 + 4$.
$4^2 + 5^2 + 6^2 + 4 = 16 + 25 + 36 + 4 = 81$ 80 is less than 81. Circle 80 in Domenic's row.

☑ Sawyer's address is greater than 8^3.
$8^3 = 8 \times 8 \times 8 = 512$ 735 is greater than 512. Circle 735 in Sawyer's row.

Mia	80	225	500	720	735
McKay	18	720	✦ Hint: Some of the rows, like McKay's, won't have numbers all the way across.		
Heidi	80	500	720		
Grayson	32	80	196	500	720
Sawyer	201	225	459	735	
Elijah	13	17	29		
Domenic	80	201	500	720	

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CONVERTING UNITS OF LENGTH

Video Lesson

Top Box

4 m = 4,000 mm
4 × 10^3 = 4,000

Middle Box

600,000 cm = 6 km
600,000 ÷ 10^5 = 6

Bottom Box

27 ft = 9 yd
27 ÷ 3 = 9

Practice

1. a. (given)

b. (given)

c. 1 foot = 12 inches
3 × 12 = 36
36 inches = 3 feet

d. 1 yard = 3 feet
12 ÷ 3 = 4
12 feet = 4 yards

e. 1 foot = 12 inches
48 ÷ 12 = 4
48 inches = 4 feet

f. 1 yard = 3 feet
5 × 3 = 15
15 feet = 5 yards

g. (given)

h. (given)

2. a. (given)

b. 400 × 10^1 = 4,000
400 ÷ 10^2 = 4
4,000 mm = 400 cm = 4 m

c. 800 × 10^1 = 8,000
800 ÷ 10^2 = 8
8,000 mm = 800 cm = 8 m

d. 6,000 × 10^1 = 60,000
6,000 ÷ 10^2 = 60
60,000 mm = 6,000 cm = 60 m

3. a. (ruler) yardstick

b. ruler (yardstick)

c. ruler (yardstick)

d. (ruler) yardstick

4. a. 1 mile = 1,760 yards
= 5,280 feet = 63,360 inches

b. 1 kilometer = 10 hectometers
= 100 dekameters = 1,000 meters

5. a. 1 foot = 12 inches
5 × 12 = 60
60 inches

b. 1 yard = 36 inches
1 yard

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6. **My measurement is greater than 300 mm.**
Cross off 70 mm and 120 mm.
10 × 10 = 100 10 cm = 100 mm
Cross off 10 cm.

My measurement is less than 80 km.
Cross off 99 km.
100,000 ÷ 10^3 = 100 100,000 m = 100 km
Cross off 100,000 m.

My number is divisible by 3.
40 m: 4 + 0 = 4 4 is not divisible by 3, so 40 is not divisible by 3.
8 km: 8 is not divisible by 3.
100 cm: 1 + 0 + 0 = 1 1 is not divisible by 3, so 100 is not divisible by 3.
320 cm: 3 + 2 + 0 = 5 5 is not divisible by 3, so 320 is not divisible by 3.
Cross off 40 m, 8 km, 100 cm, and 320 cm.

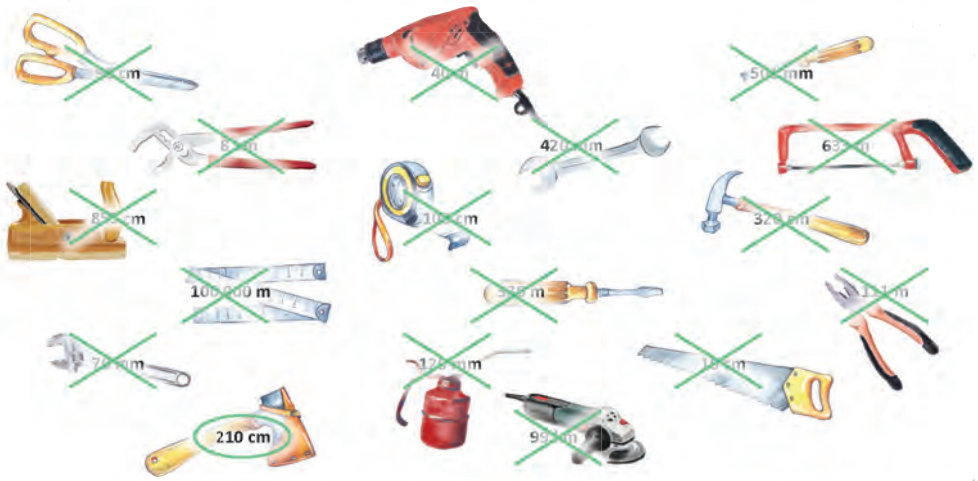
My number is even.
Cross off 501 mm, 855 cm, 633 m, and 111 m.

My number is not divisible by 4.
420 mm: 20 is divisible by 4, so 420 is divisible by 4.
Cross off 420 mm.

There are three digits in my number.
90 cm: 90 only has two digits.
Cross off 90 cm.

If you multiply the digits in my number, the product is 0.
330: 3 × 3 × 0 = 0 The product is 0.
210: 2 × 1 × 0 = 0 The product is 0.

If you add the digits in my number, the sum is 3.
330: 3 + 3 + 0 = 6 The sum is 6.
210: 2 + 1 + 0 = 3 The sum is 3.
Cross off 330 m. The number is 210 cm.

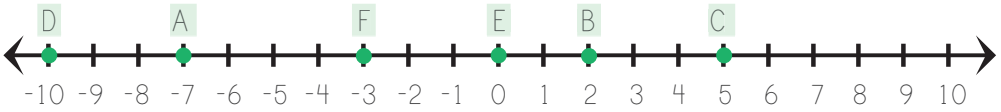


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POSITIVE AND NEGATIVE NUMBERS

Video Lesson

Number Line



Left Box

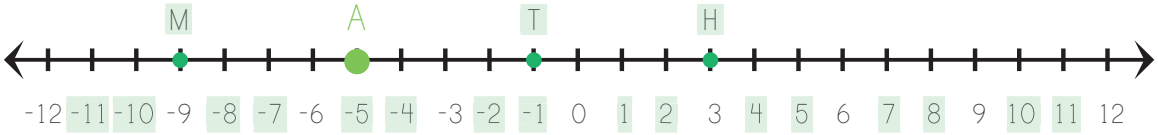
Opposite of 9: -9 Opposite of -1: 1

Right Box

0 > -5 or -5 < 0
-2 > -7 or -7 < -2

Practice

1. a.–d. See number line.



2. -25

3. 0

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4.

Number	Opposite
3	-3
-1	1
-4	4
12	-12
155	-155
-49	49
-77	77
5	-5
-892	892
90	-90
36	-36

5. a. -40 + 10 = -30
-30 + 10 = -20
-20 + 10 = -10
-10 + 10 = 0
0 + 10 = 10
10 + 10 = 20
20 + 10 = 30
30 + 10 = 40
40 + 10 = 50

-40, -30, -20, -10, 0, 10, 20, 30, 40, 50

rule: add 10

b. 10 - 5 = 5
5 - 5 = 0
0 - 5 = -5
-5 - 5 = -10
-10 - 5 = -15
-15 - 5 = -20
-20 - 5 = -25
-25 - 5 = -30
-30 - 5 = -35
-35 - 5 = -40

10, 5, 0, -5, -10, -15, -20, -25, -30, -35, -40

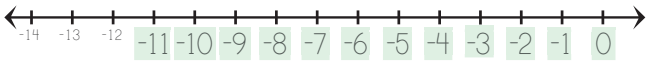
rule: subtract 5

c. -4 + 2 = -2
-2 + 2 = 0
0 + 2 = 2
2 + 2 = 4
4 + 2 = 6
6 + 2 = 8
8 + 2 = 10
10 + 2 = 12
12 + 2 = 14
14 + 2 = 16
16 + 2 = 18

-4, -2, 0, 2, 4, 6, 8, 10, 12, 14, 16, 18

rule: add 2

6.



7. a. 0 - 5 = -5
-5 °F

b. -19 - 4 = -23
-23 °C

8. a. -6 < 0

b. -2 < 1

c. 0 < 4

d. 12 > -22

e. -7 > -17

f. -10 < -9

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Review

1. a.
$$\begin{array}{r} {\scriptstyle 1} \\ 531 \\ 265 \\ +\,483 \\ \hline 1{,}279 \end{array}$$

b.
$$\begin{array}{r} {\scriptstyle 1} \\ 455 \\ 391 \\ +\,832 \\ \hline 1{,}678 \end{array}$$

2. a. $3\overline{)98^{2}7}$ R 329

b. $6\overline{)1{,}29^{3}6}$ R 216

3. Answers may vary if students rounded the numbers differently.

a. 92 cm rounds to ⟶ 90 cm
90 cm × 90 cm = 8,100 cm^2

estimated area: 8,100 cm^2

b. 19 yd rounds to ⟶ 20 yd
7 yd rounds to ⟶ 10 yd
20 yd × 10 yd = 200 yd

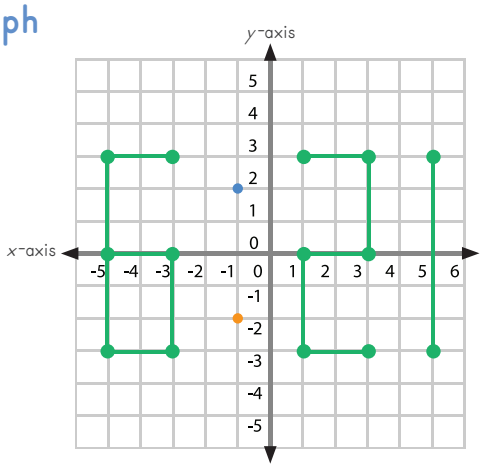
estimated area: 200 yd^2

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GRAPHING ORDERED PAIRS

Video Lesson

Graph



Blue Box

(-1, 2)

Orange Box

(-1, -2)

Practice

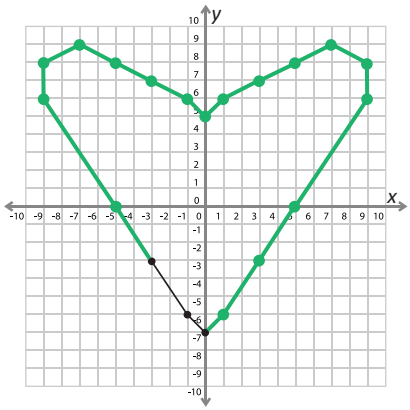
1.

(3, 4)	(given)
(-4, 2)	E
(6, 0)	F
(8, -5)	C
(-3, -6)	A
(0, 7)	B

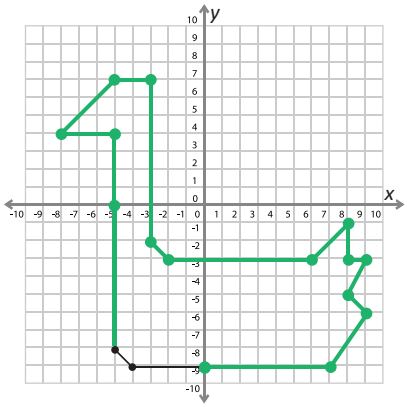
2.

A	(given)
B	(-7, 4)
C	(-3, -3)
D	(9, -5)
E	(1, 1)

3.



4.



5. Answers will vary.

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Review

1.

a. 1 foot = 12 inches

b. 1 yard = 3 feet

c. 1 foot = 12 inches
4 × 12 = 48
4 feet = 48 inches

d. 1 yard = 3 feet
10 × 3 = 30
10 yards = 30 feet

e. 1 foot = 12 inches
9 × 12 = 108
9 feet = 108 inches

f. 1 yard = 3 feet
6 × 3 = 18
6 yards = 18 feet

2.

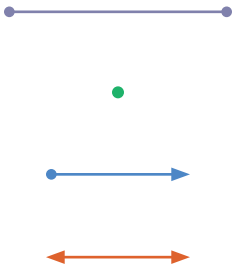
Exponent Form	Factored Form	Standard Form
3^3	3 × 3 × 3	27
4^2	4 × 4	16
2^4	2 × 2 × 2 × 2	16
10^3	10 × 10 × 10	1,000
7^2	7 × 7	49

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IDENTIFYING AND DRAWING GEOMETRIC FIGURES

Video Lesson

Top Problem



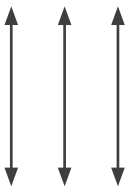
Bottom Problem

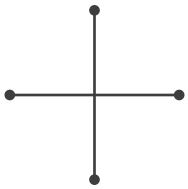


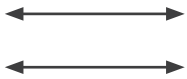
Practice

1. line point

   line segment ray

2. 

3. 

4. 

5. 

6. Answers will vary.

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Review

1. least to greatest: 3, 3, 3, 5, 5, 7, 9

3 + 3 + 3 + 5 + 5 + 7 + 9 = 35
There are seven numbers.
35 ÷ 7 = 5
mean: 5

3, 3, 3, 5, 5, 7, 9
median: 5

3, 3, 3, 5, 5, 7, 9
mode: 3

3, 3, 3, 5, 5, 7, 9
9 - 3 = 6
range: 6

2. a. $\sqrt{225}$ = 15

b. $\sqrt{196}$ = 14

3. a. The exponent is 2. Add 2 zeros after 414.
414×10^2 = 41,400

b. The exponent is 2. Take 2 zeros off of 4,000.
$4{,}000 \div 10^2$ = 40

4. a. -2 > -4

b. -10 < 2

c. 0 > -4

5. 1 foot = 12 inches
Convert 2 feet to inches:
2 × 12 = 24
2 feet = 24 inches

Add 4 inches to 24 inches:
24 inches + 4 inches = 28 inches

2 feet 4 inches = 28 inches

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NAMING GEOMETRIC FIGURES

Video Lesson

Answers will vary. Sample answers are shown below.

Red Box

triangle

Yellow Box

ΔACB

Green Box

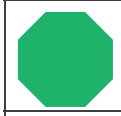
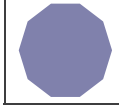
$\overrightarrow{HL}$ or $\overrightarrow{GM}$

Purple Box

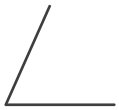
$\angle JIE$, $\angle EIJ$, $\angle JIH$, or $\angle HIJ$

Practice

1.

	Name	Number of Sides	Number of Vertices
	triangle	3	3
	hexagon	6	6
	quadrilateral	4	4
	pentagon	5	5
	octagon	8	8
	dodecagon	12	12
	decagon	10	10

2. a. Angle orientation and size may vary, but it should measure less than 90°.

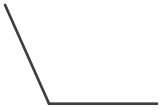


b. Angle orientation may vary, but it should be a straight line.

c. Angle orientation may vary, but it should measure 90°.



d. Angle orientation and size may vary, but it should measure more than 90°.



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3. a. (given)

b. $\overline{ST}$ or $\overline{TS}$

c. $\overrightarrow{NL}$ or $\overrightarrow{NM}$

4. Answers will vary. Some sample answers are given.

ears (name two triangles):
ΔACF and ΔBGE The letters of each triangle may be in a different order.

face (name two line segments):
$\overline{CF}$, $\overline{DC}$, $\overline{DJ}$, $\overline{DE}$, $\overline{EG}$, $\overline{FJ}$, $\overline{FH}$, $\overline{GI}$, $\overline{GJ}$, $\overline{IJ}$, or $\overline{JH}$ The order of the letters may be switched.

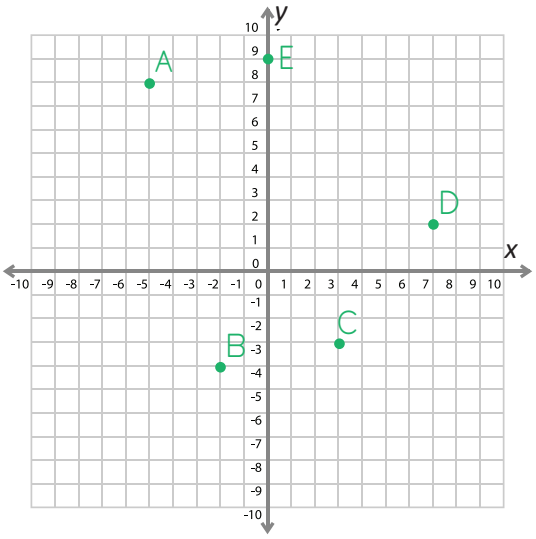
front legs (name two triangles):
ΔHLJ and ΔILJ The letters of each triangle may be in a different order.

body (name two line segments):
$\overline{IL}$, $\overline{KI}$, $\overline{ML}$, or $\overline{KM}$ The order of the letters may be switched.

tail (name one angle):
$\angle KNO$, $\angle NOK$, or $\angle OKN$

Review

1.



2. 1, 2, 5, 10, 25, 50

3. a. $9\overline{)2{,}718}$ = 302

b. $8\overline{)3{,}280}$ = 410

4. $11^2 = 121$

$\sqrt{144} = 12$

$13^2 = 169$

$\sqrt{196} = 14$

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MEASURING AND DRAWING ANGLES

Video Lesson

Left Box

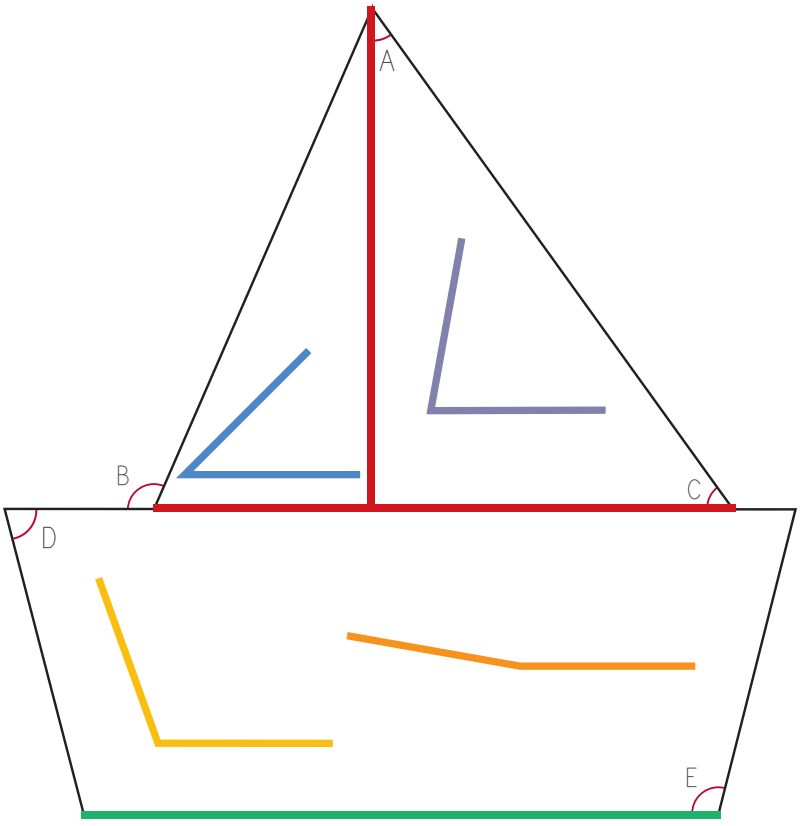
60°

Right Box



Practice

Answers may vary. Examples of angle placement are shown below. Angle orientation and placement may vary, but the measure should be the same.



Note: The student's angle measures may differ by a few degrees.

A: 35°
B: 115°
C: 55°
D: 75°
E: 105°

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Angle	Type of Angle (acute, right, obtuse, or straight)	Estimated Degrees (your best guess)	Actual Degrees
∠F	obtuse	Answers will vary.	140°
∠G	acute		70°
∠H	acute		65°
∠I	right		90°
∠J	acute		20°

Review

1. a. $9\overline{)3,8^{2}5^{7}3}$ = 428 R1

   b. $12\overline{)2,5^{1}08}$ = 209

2. a. 1 foot = 12 inches
   8 × 12 = 96
   8 feet = 96 inches

   b. 1 yard = 3 feet
   9 × 3 = 27
   9 yards = 27 feet

3. a. $\overrightarrow{AB}$

   b. ∠DCE, ∠ECD, or ∠C

   c. $\overleftrightarrow{FG}$ or $\overleftrightarrow{GF}$

4. -11, -7, -5, -2, 0, 3, 4

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GEOMETRIC SOLIDS

Video Lesson

Top Problem

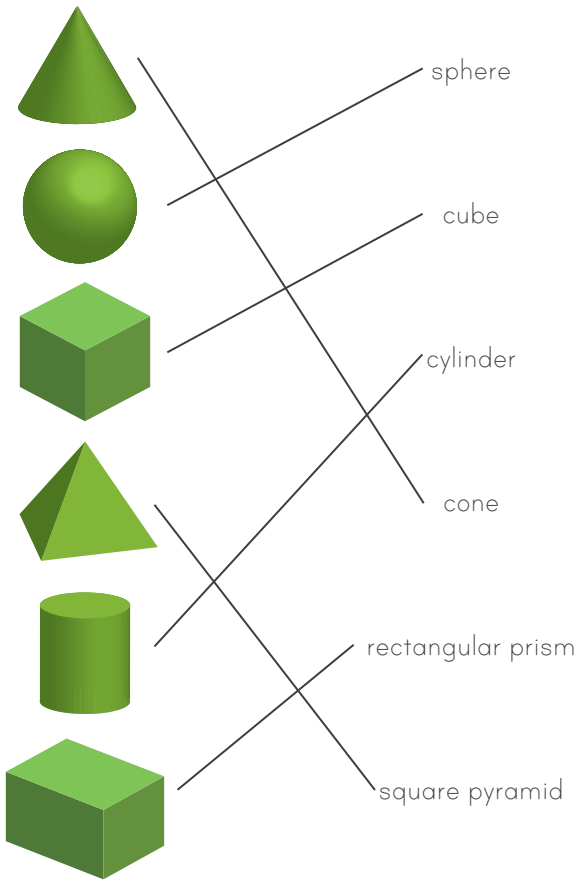
rectangular prism
faces: 6
edges: 12
vertices: 8

Bottom Problem

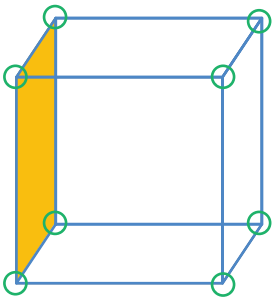
cone
faces: 1
edges: 0
vertices: 0

Practice

1.



2. Any face may be shaded yellow.



3.

a. cone, sphere, cylinder

b. cone, pyramid

c. square pyramid

d. cylinder

e. square pyramid

f. cube, rectangular prism

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4. Answers will vary. Sample answers are given.

a. ball, orange, marble

b. dice, box, block

c. ice cream cone, carrot, party hat

d. candle, can, drum

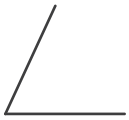
5. a. sphere, cylinder, or cone

b. cylinder

c. square pyramid

Review

1. Angle orientation and placement may vary, but the measure should be 65°.



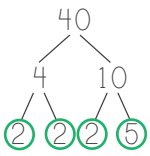
2. Student answer may differ by a few degrees.

110°

3. a. $(5 - 2) \times 5 + 4^2 =$
$3 \times 5 + 4^2 =$
$3 \times 5 + 16 =$
$15 + 16 =$
31

b. The exponent is 5. Add 5 zeros after 31.
$31 \times 10^5 =$ 3,100,000

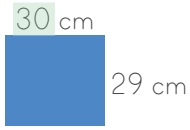
4. Different factors may have been chosen for the first branches. An example is shown below.



$2 \times 2 \times 2 \times 5$

5. 928 cm^2 rounds to ⟶ 900 cm^2
29 cm rounds to ⟶ 30 cm

$900 \div 30 = 30$



The missing length is ≈ 30 cm.

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SIMILAR AND CONGRUENT GEOMETRIC FIGURES

Video Lesson

Answers will vary.

Practice

1. a. similar

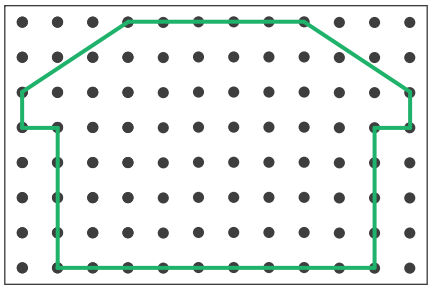
   b. A B C D F

   c. neither

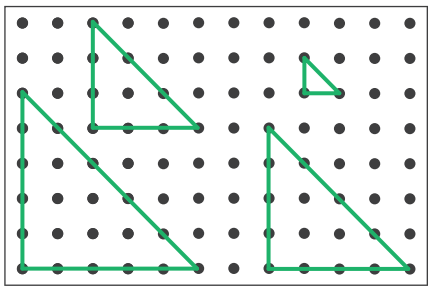
   d. A B C E F

   e. 15

2. The congruent decagon will have the same size and shape as the original decagon, but it may be flipped.



3. The similar triangle can be larger or smaller but should have the same shape. Some examples are shown.



4. Answers will vary. The triangles should have the same size and shape but may be orientated differently.

5. Answers will vary. The two shapes should be different shapes.

6.



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Review

1. fraction: $\frac{69}{100}$

percent: 69%

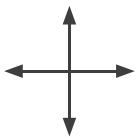
2. 600:
600 is even, so 600 is divisible by 2.
6 + 0 + 0 = 6 6 is divisible by 3, so 600 is divisible by 3.
The number formed by the last two digits (00) is divisible by 4, so 600 is divisible by 4.
6 (the sum) is not divisible by 9, so 600 is not divisible by 9.

624:
624 is even, so 624 is divisible by 2.
6 + 2 + 4 = 12 12 is divisible by 3, so 624 is divisible by 3.
The number formed by the last two digits (24) is divisible by 4, so 624 is divisible by 4.
12 (the sum) is not divisible by 9, so 624 is not divisible by 9.

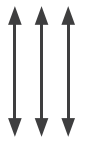
648:
648 is even, so 648 is divisible by 2.
6 + 4 + 8 = 18 18 is divisible by 3, so 648 is divisible by 3.
The number formed by the last two digits (48) is divisible by 4, so 648 is divisible by 4.
18 (the sum) is divisible by 9, so 648 is divisible by 9.

600 624 (648)
648 is the only number in this list that is divisible by 2, 3, 4, and 9.

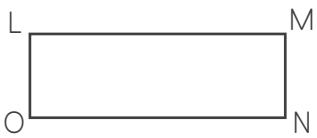
3. a.



b.



4.



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5. vertices: 6

edges: 9

faces: 5

6. 0, 1, ~~2~~, ~~3~~, ~~4~~, ~~5~~, ~~6~~, ~~7~~, ~~8~~, ~~9~~, ~~10~~, ~~11~~, ~~12~~, ~~13~~, ~~14~~, ~~15~~, ~~16~~, ~~17~~, ~~18~~, ~~19~~, ~~20~~

0 and 1 are neither prime nor composite.

UNIT ASSESSMENT

Number Patterns/Divisibility Strategies

1. 110 + 15 = 125
125 + 15 = 140
140 + 15 = 155
155 + 15 = 170
170 + 15 = 185
185 + 15 = 200

110, 125, 140, 155, 170, 185, 200
rule: add 15

2. The number is divisible by 2 because it is even.
9 + 6 + 4 + 0 = 19 19 is not divisible by 3, so 9,640 is not divisible by 3.
The number formed by the last two digits (40) is divisible by 4, so 9,640 is divisible by 4.
The number is divisible by 5 because it ends in a 0.
The number is not divisible by 6 because it is not divisible by 3.
The sum of the digits (19) is not divisible by 9, so 9,640 is not divisible by 9.
The number is divisible by 10 because it ends in a 0.

(2) 3 (4) (5) 6 9 (10)

Number Patterns/Divisibility Strategies Additional Practice

1. 99 - 11 = 88
88 - 11 = 77
77 - 11 = 66
66 - 11 = 55
55 - 11 = 44
44 - 11 = 33

99, 88, 77, 66, 55, 44, 33
rule: subtract 11

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2. The number is divisible by 2 because it is even.
4 + 8 + 2 + 4 = 18 18 is divisible by 3, so 4,824 is divisible by 3.
The number formed by the last two digits (24) is divisible by 4, so 4,824 is divisible by 4.
The number is not divisible by 5 because it does not end in a 0 or 5.
The number is divisible by 6 because it is divisible by both 2 and 3.
The sum of the digits (18) is divisible by 9, so 4,824 is divisible by 9.
The number is not divisible by 10 because it does not end in a 0.

(2) (3) (4) 5 (6) (9) 10

Factors of Prime & Composite Numbers

1. 17: 1, (17)

2. 20: 1, (2), 4, (5), 10, 20

3. 35: 1, (5), (7), 35

4. 41: 1, (41)

Factors of Prime & Composite Numbers Additional Practice

1. 30: 1, (2), (3), (5), 6, 10, 15, 30

2. 55: 1, (5), (11), 55

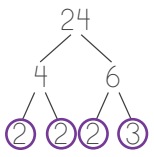
3. 18: 1, (2), (3), 6, 9, 18

4. 43: 1, (43)

Prime Factorization

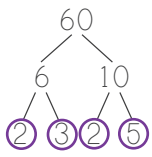
Different factors could have been chosen for the first branches. An example for each is shown below.

1.



2 × 2 × 2 × 3

2.



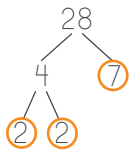
2 × 2 × 3 × 5

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Prime Factorization Additional Practice

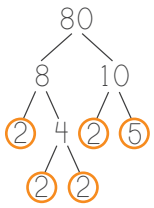
Different factors could have been chosen for the first branches. An example for each is shown below.

1.



$2 \times 2 \times 7$

2.



$2 \times 2 \times 2 \times 2 \times 5$

Exponents/Multiply & Divide by Powers of 10

1. $7^2 = 7 \times 7 = 49$

2. $2^4 = 2 \times 2 \times 2 \times 2 = 16$

3. $3^3 = 3 \times 3 \times 3 = 27$

4. $12^0 = 1$

5. The exponent is 6. Add 6 zeros after 53.
$53 \times 10^6 = 53{,}000{,}000$

6. The exponent is 5. Take 5 zeros off of 9,000,000.
$9{,}000{,}000 \div 10^5 = 90$

Exponents/Multiply & Divide by Powers of 10 Additional Practice

1. $2^3 = 2 \times 2 \times 2 = 8$

2. $3^4 = 3 \times 3 \times 3 \times 3 = 81$

3. $13^0 = 1$

4. $4^3 = 4 \times 4 \times 4 = 64$

5. The exponent is 8. Add 8 zeros after 64.
$64 \times 10^8 = 6{,}400{,}000{,}000$

6. The exponent is 4. Take 4 zeros off of 750,000.
$750{,}000 \div 10^4 = 75$

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Order of Operations

1. $16 + 3 \times 2 - 3^2 =$
   $16 + 3 \times 2 - 9 =$
   $16 + 6 - 9 =$
   $22 - 9 =$
   13

2. $(10 - 2) \times 2^3 + 5 =$
   $8 \times 2^3 + 5 =$
   $8 \times 8 + 5 =$
   $64 + 5 =$
   69

3. $2 \times 11 - 12 \div 3 =$
   $22 - 12 \div 3 =$
   $22 - 4 =$
   18

4. $12 \div 2^2 \times 7 - 5 =$
   $12 \div 4 \times 7 - 5 =$
   $3 \times 7 - 5 =$
   $21 - 5 =$
   16

Order of Operations Additional Practice

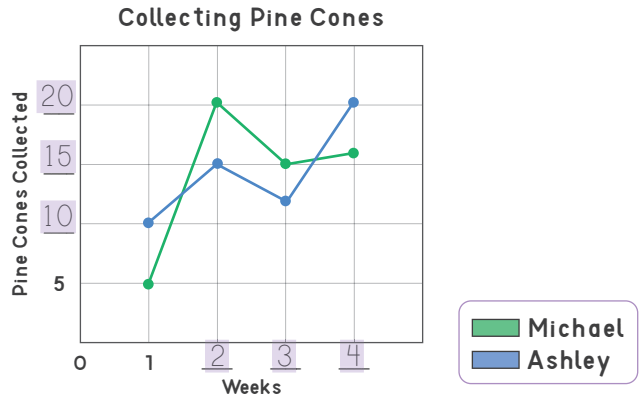
1. $70 - (6 \times 10) \div 2 =$
   $70 - 60 \div 2 =$
   $70 - 30 =$
   40

2. $8 \times 2^2 - 12 + 3 =$
   $8 \times 4 - 12 + 3 =$
   $32 - 12 + 3 =$
   $20 + 3 =$
   23

3. $(35 - 5) \div 3 + 3^2 =$
   $30 \div 3 + 3^2 =$
   $30 \div 3 + 9 =$
   $10 + 9 =$
   19

4. $15 + 4 - 14 \div 7 =$
   $15 + 4 - 2 =$
   $19 - 2 =$
   17

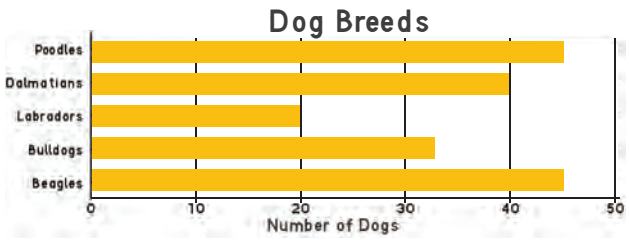
Line Graphs/Bar Graphs

1. 

2. a. Thursday
   b. purple
   c. Thursday

Line Graphs/Bar Graphs Additional Practice

1.

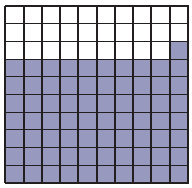


Fractions & Percents

1. fraction: $\frac{18}{100}$

   percent: 18%

2.



3.

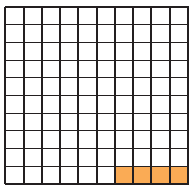
Cents	Fraction of a Dollar	Percent of a Dollar
28¢	$\frac{28}{100}$	28%
99¢	$\frac{99}{100}$	99%
63¢	$\frac{63}{100}$	63%

Fractions & Percents Additional Practice

1. fraction: $\frac{45}{100}$

   percent: 45%

2.



3.

Cents	Fraction of a Dollar	Percent of a Dollar
58¢	$\frac{58}{100}$	58%
3¢	$\frac{3}{100}$	3%
70¢	$\frac{70}{100}$	70%

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Multiplication Properties/Missing Numbers

1. $5 \times 14 \times 2 =$
   $5 \times 2 \times 14 =$
   $10 \times 14 =$
   140

2. $9 \times 6 \times 5 =$
   $9 \times 30 =$
   270

3. $12C = 132$
   Inverse operation:
   $132 \div 12 = C$

$$12\overline{)13^{1}2}\quad 11$$

   $C =$ 11

Multiplication Properties/Missing Numbers Additional Practice

1. $7 \times 5 \times 2 =$
   $7 \times 10 =$
   70

2. $8 \times 2 \times 5 =$
   $8 \times 10 =$
   80

3. $11F = 110$
   Multiplication facts:
   $11 \times 10 = 110$
   $F =$ 10

Long Division & Short Division

1. a. $6\overline{)724}$ 120 R4

$$\begin{array}{r} -\,6 \\ \hline 12 \\ -\,12 \\ \hline 04 \\ -\,\;0 \\ \hline 4 \end{array}$$

   b. $21\overline{)8,421}$ 401

$$\begin{array}{r} -\,8\,4 \\ \hline 02 \\ -\,\;0 \\ \hline 21 \\ -\,21 \\ \hline 0 \end{array}$$

2. a. $5\overline{)14^{4}0}$ 28

   b. $11\overline{)2,3^{1}2^{1}1}$ 211

Long Division & Short Division Additional Practice

1. a. 790 R2
   3)2,372
   -21
   27
   -27
   02
   -0
   2

   b. 230
   20)4,600
   -40
   60
   -60
   00
   -0
   0

2. a. 107 R1
   7)750

   b. 211
   12)2,513 12

Perfect Squares & Square Roots

1. $8^2 = 64$
2. $5^2 = 25$
3. $15^2 = 225$
4. $11^2 = 121$
5. $\sqrt{49} = 7$
6. $\sqrt{81} = 9$
7. $\sqrt{144} = 12$

Perfect Squares & Square Roots Additional Practice

1. $10^2 = 100$
2. $4^2 = 16$
3. $6^2 = 36$
4. $9^2 = 81$
5. $\sqrt{121} = 11$
6. $\sqrt{225} = 15$
7. $\sqrt{64} = 8$

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Estimate Products & Quotients Using Area

1. 21 mm rounds to ⟶ 20 mm
   39 mm rounds to ⟶ 40 mm

   20 mm × 40 mm = 800 mm^2

2. 787 ft^2 rounds to ⟶ 800 ft^2
   36 ft rounds to ⟶ 40 ft

   800 ft^2 ÷ 40 ft = 20 ft

Estimate Products & Quotients Using Area Additional Practice

1. 52 m rounds to ⟶ 50 m
   19 m rounds to ⟶ 20 m

   50 m × 20 m = 1,000 m^2

2. 156 yd^2 rounds to ⟶ 150 yd^2
   14 yd rounds to ⟶ 15 yd

   150 yd^2 ÷ 15 yd = 10 yd

Mean, Median, Mode & Range

1. a. least to greatest: 2, 4, 7, 9, 10, 10

   b. 2 + 4 + 7 + 9 + 10 + 10 = 42
   There are 6 numbers.
   42 ÷ 6 = 7
   mean: 7

   c. 2, 4, (7, 9), 10, 10
   7 + 9 = 16
   There are 2 numbers.
   16 ÷ 2 = 8
   median: 8

   d. 2, 4, 7, 9, (10, 10)
   mode: 10

   e. (2), 4, 7, 9, 10, (10)
   10 - 2 = 8
   range: 8

Mean, Median, Mode & Range Additional Practice

1. a. least to greatest: 5, 8, 10, 12, 20

   b. 5 + 8 + 10 + 12 + 20 = 55
   There are 5 numbers.
   55 ÷ 5 = 11
   mean: 11

   c. 5, 8, (10), 12, 20
   median: 10

   d. 5, 8, 10, 12, 20
   mode: no mode

   e. (5), 8, 10, 12, (20)
   20 - 5 = 15
   range: 15

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Converting Units of Length

1. 2 ft = ____ in
   1 ft = 12 in
   2 × 12 = 24
   2 ft = 24 in

2. 36 in = ____ ft
   1 ft = 12 in
   36 ÷ 12 = 3
   36 in = 3 ft

3. 3 cm = ____ mm
   1 cm = 10 mm
   $3 \times 10^1 = 30$
   3 cm = 30 mm

4. 6 m = ____ cm
   1 m = 100 cm
   $6 \times 10^2 = 600$
   6 m = 600 cm

5. 400 cm = ____ m
   100 cm = 1 m
   $400 \div 10^2 = 4$
   400 cm = 4 m

6. 50 mm = ____ cm
   10 mm = 1 cm
   $50 \div 10^1 = 5$
   50 mm = 5 cm

Converting Units of Length Additional Practice

1. 5 ft = ____ in
   1 ft = 12 in
   5 × 12 = 60
   5 ft = 60 in

2. 48 in = ____ ft
   1 ft = 12 in
   48 ÷ 12 = 4
   48 in = 4 ft

3. 8 cm = ____ mm
   1 cm = 10 mm
   $8 \times 10^1 = 80$
   8 cm = 80 mm

4. 7 m = ____ cm
   1 m = 100 cm
   $7 \times 10^2 = 700$
   7 m = 700 cm

5. 200 cm = ____ m
   100 cm = 1 m
   $200 \div 10^2 = 2$
   200 cm = 2 m

6. 60 mm = ____ cm
   10 mm = 1 cm
   $60 \div 10^1 = 6$
   60 mm = 6 cm

Positive & Negative Numbers

1. least to greatest: -12, -6, -1, 0, 5, 8

2. a. 8 > -3

   b. -1 < 0

   c. -80 < -11

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Positive & Negative Numbers Additional Practice

1. least to greatest: -14, -11, -7, 2, 13

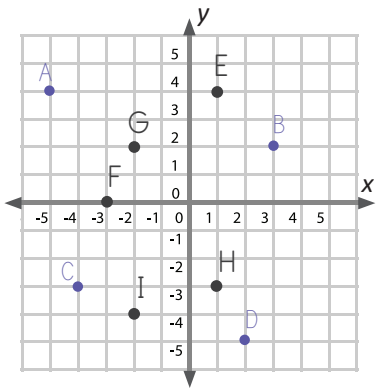
2. a. $-3 < 2$

   b. $0 > -5$

   c. $-100 < -99$

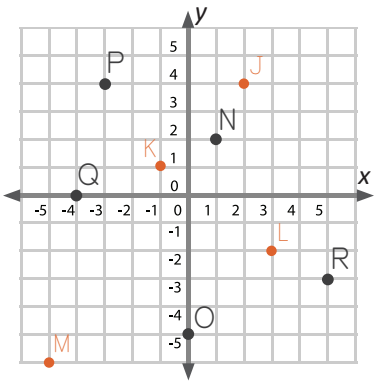
Graphing Ordered Pairs

1. A: (-5, 4)
   B: (3, 2)
   C: (-4, -3)
   D: (2, -5)

2. 

Graphing Ordered Pairs Additional Practice

1. J: (2, 4)
   K: (-1, 1)
   L: (3, -2)
   M: (-5, -6)

2. 

Identify, Draw & Name Geometric Figures

1. a. one vertical:



b. two parallel: (Lines do not have to be vertical, but they should be parallel.)



2. a. $\overrightarrow{EM}$

b. pentagon

Identify, Draw & Name Geometric Figures Additional Practice

1. a. one horizontal:

b. two perpendicular:



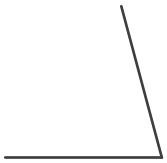
2. a. $\overleftrightarrow{EM}$ or $\overleftrightarrow{ME}$

b. ΔXYZ or any combination of these letters

Measuring & Drawing Angles

1. 30° Student answer may differ by a few degrees.

2.

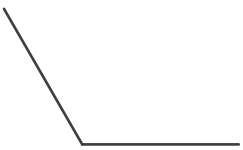


Angle orientation and placement may vary, but the measure should be 75°.

Measuring & Drawing Angles Additional Practice

1. 150° Student answer may differ by a few degrees.

2.



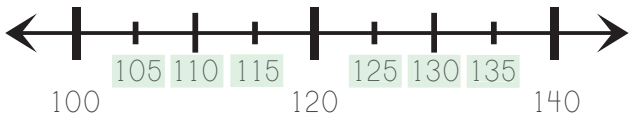
Angle orientation and placement may vary, but the measure should be 120°.

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READING SCALES AND USING A RULER

Video Lesson

Top Problem



Middle Problem

$2\frac{5}{10}$ cm or $2\frac{1}{2}$ cm

Bottom Problem

$3\frac{5}{8}$ in

Practice

1.

a. 250 mL

b. 90 dB

c. 23 °F

d. -5 °C

e. $4\frac{5}{10}$ mph or $4\frac{1}{2}$ mph

f. 350 km/h

2. If home-printed pages are used with a purchased ruler, measurements may vary as the scale may not match. Check to see that the child's answers match up correctly with the ruler used.

a. $7\frac{3}{10}$ cm

b. 73 mm

c. $6\frac{2}{10}$ cm or $6\frac{1}{5}$ cm

d. 62 mm

e. $5\frac{7}{10}$ cm

f. 57 mm

3. If home-printed pages are used with a purchased ruler, measurements may vary as the scale may not match. Check to see that the child's answers match up correctly with the ruler used.

a. $1\frac{5}{8}$ in

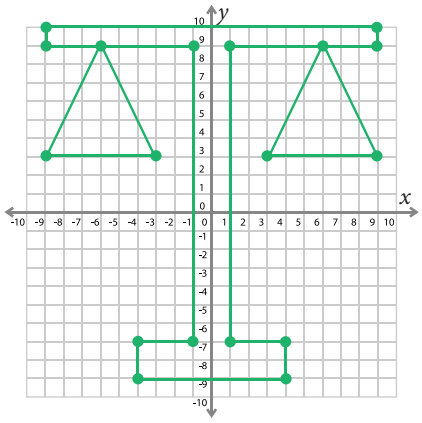
b. $4\frac{6}{8}$ in or $4\frac{3}{4}$ in

c. $9\frac{4}{8}$ in or $9\frac{1}{2}$ in

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Review

1.



2. Designs on the graph will vary.

a. (-3, 7)

b. (5, 5)

c. (-7, 3)

d. (-2, 3)

e. (-9, -3)

f. (4, -3)

g. (-3, -5)

h. (2, -8)

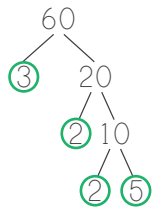
3.

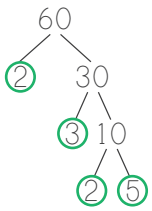
```
  1,052
9)9,468
 -9
  04
 - 0
   46
  -45
    18
   -18
     0
```

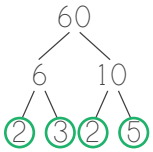
Check:

```
   4 1
 1,052
×    9
9,468
```

4. Students only need to show one way, but three examples are given below.







$2 \times 2 \times 3 \times 5$

5.

Cents	Fraction of a Dollar	Percent of a Dollar
52¢	$\frac{52}{100}$	52%
4¢	$\frac{4}{100}$	4%
67¢	$\frac{67}{100}$	67%

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CONVERTING UNITS OF WEIGHT

Video Lesson

Top Problem

16 g = 16,000 mg
16 × 10^3 = 16,000

Middle Problem

8,000 lb = 4 tn
8,~~000~~ ÷ 2,~~000~~ = 8 ÷ 2
8,000 ÷ 2,000 = 4

Bottom Problem

320 oz = 20 lb

$$16\overline{)320}\quad 20$$

320 ÷ 16 = 20

Practice

1. a. 1 lb = 16 oz

b. 1 lb = 16 oz
10 × 16 = 160
10 lb = 160 oz

c. 1 lb = 16 oz
32 ÷ 16 = 2
32 oz = 2 lb

d. 1 lb = 16 oz
80 ÷ 16 = 5
80 oz = 5 lb

2. a. 9 × 10^3 = 9,000
9 kg = 9,000 g

b. 68 × 10^3 = 68,000
68 kg = 68,000 g

c. 17,000 ÷ 10^3 = 17
17,000 g = 17 kg

d. 7,000 ÷ 10^3 = 7
7,000 g = 7 kg

3. a. 90 × 10^3 = 90,000
90 g = 90,000 mg

b. 120 × 10^3 = 120,000
120 g = 120,000 mg

c. 80,000 ÷ 10^3 = 80
80,000 mg = 80 g

4. a. 8,000 ÷ 10^3 = 8
8,000 × 10^3 = 8,000,000
8 kg = 8,000 g = 8,000,000 mg

b. 1 lb = 16 oz

$$\begin{array}{r} 11 \\ \times\ 16 \\ \hline 66 \\ +110 \\ \hline 176 \end{array}$$

11 lb = 176 oz

c. 1 lb = 16 oz

$$\begin{array}{r} {\scriptstyle 3}\ 16 \\ \times\ \ 6 \\ \hline 96 \end{array}$$

6 lb = 96 oz

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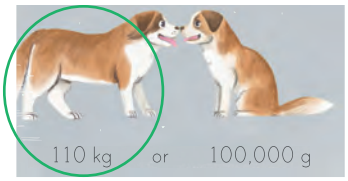
5. a. 1 lb = 16 oz
5 × 16 = 80
5 lb = 80 oz
80 oz < 85 oz



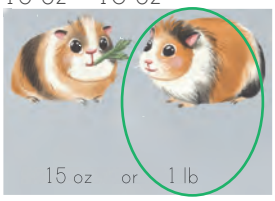
b. 1 tn = 2,000 lb
2,000 lb > 1,200 lb



c. $110 \times 10^3 = 110{,}000$
110 kg = 110,000 g
110,000 g > 100,000 g



d. 1 lb = 16 oz
15 oz < 16 oz



6. a. 1 tn = 2,000 lb
6 × 2,000 = 12,000
6 tn = 12,000 lb

b. 1 tn = 2,000 lb
10,~~000~~ ÷ 2,~~000~~ = 10 ÷ 2 = 5
10,000 lb = 5 tn

c. 1 tn = 2,000 lb
8,~~000~~ ÷ 2,~~000~~ = 8 ÷ 2 = 4
8,000 lb = 4 tn

7. a. 1 lb = 16 oz

$$\begin{array}{r} {\scriptstyle 3} \\ 16 \\ \times\,16 \\ \hline {\scriptstyle 1}96 \\ +160 \\ \hline 256 \end{array}$$

16 lb = 256 oz

b. 1 lb = 16 oz
2 × 16 = 32
2 lb = 32 oz

c. 1 lb = 16 oz
48 ÷ 16 = 3
48 oz = 3 lb

d. 1 lb = 16 oz
160 ÷ 16 = 10
160 oz = 10 lb

8. a. $45 \times 10^3 = 45{,}000$
45 kg = 45,000 g

b. $1 \times 10^3 = 1{,}000$
1 kg = 1,000 g

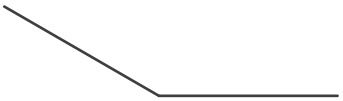
c. $15{,}000 \div 10^3 = 15$
15,000 g = 15 kg

d. $100{,}000 \div 10^3 = 100$
100,000 g = 100 kg

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Review

1. a. Angle orientation and placement may vary, but the measure should be 150°.

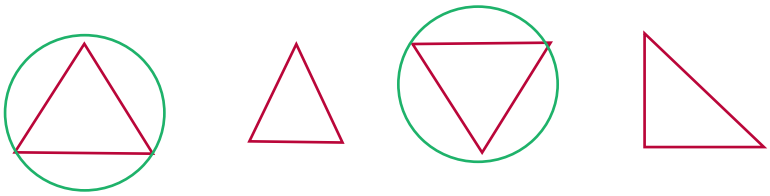


b. Angle orientation and placement may vary, but the measure should be 70°.

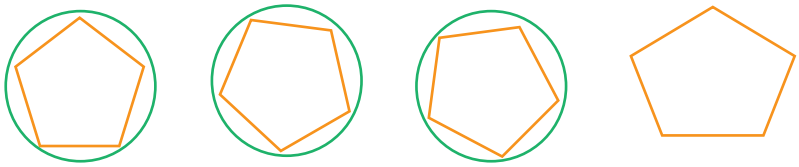


2. 100°
Student answer may differ by a few degrees.

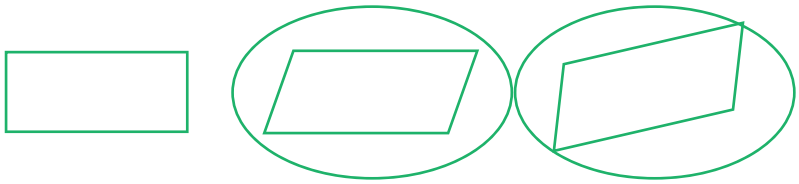
3. a.



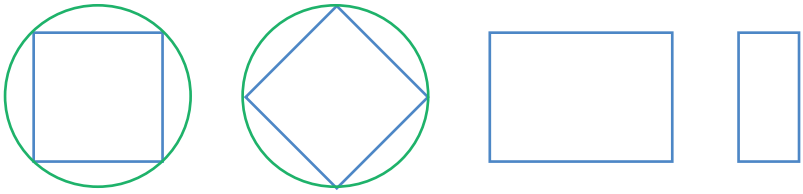
b.



c.



d.



SYMMETRY AND TRANSFORMATIONS

Video Lesson

First Line

A, D, E, H, M

Second Line

H, N, S, Z

Third Line

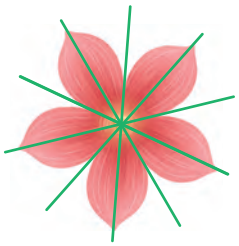
E, H, M, Z

Practice

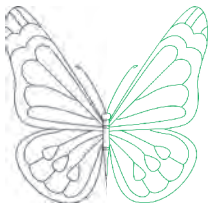
1. Answers will vary. Some possible lines of symmetry are shown.



2.



3. a.



b.



4. a. yellow

b. orange

c. pink

d. green

e. green

5. a.



across a horizontal line



across a vertical line

b.

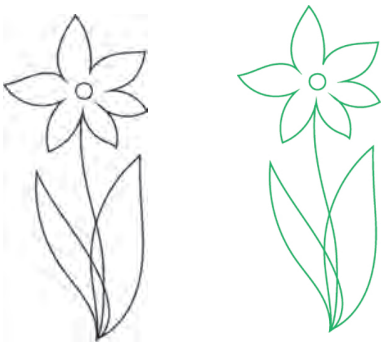


across a horizontal line

across a vertical line

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6. The exact same flower should be drawn in a different place, but the flower should not be turned or flipped.



7. a. translation, reflection or translation, rotation

b. translation, rotation

Review

1. a. ∠M, ∠TMS, or ∠SMT

b. $\overrightarrow{QS}$

c. pentagon DGHBL

The order of the letters may be switched but must follow the order around the shape.

2. a. The congruent trapezoid will have the same size and shape as the original trapezoid, but it may be flipped.



b. The congruent rhombus will have the same size and shape as the original rhombus, but it may be flipped.



3. a. 1 lb = 16 oz

b. $1 \times 10^3 = 1{,}000$
1 g = 1,000 mg

c. 1 lb = 16 oz
8 × 16 = 128
8 lb = 128 oz

d. $23 \times 10^3 = 23{,}000$
23 g = 23,000 mg

4. a. $\sqrt{121} = 11$

b. $\sqrt{100} = 10$

c. $\sqrt{225} = 15$

d. $9^2 = 9 \times 9 = 81$

e. $12^2 = 12 \times 12 = 144$

f. $7^2 = 7 \times 7 = 49$

5. a. 18 rounds to ⟶ 20
81 rounds to ⟶ 80
20 × 80 = 1,600
18 × 81 ≈ 1,600

b. 591 rounds to ⟶ 600
29 rounds to ⟶ 30

$$30\overline{)600}\quad 20$$

591 ÷ 29 ≈ 20

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COMPARING FRACTIONS USING ONE-HALF AND PICTURES

Video Lesson

Top Box

Half of 9 is $4\frac{1}{2}$. 5 is more than $4\frac{1}{2}$.

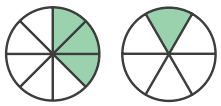
$\frac{5}{9} > \frac{1}{2}$

Middle Box

Half of 14 is 7. 3 is less than 7.

$\frac{3}{14} < \frac{1}{2}$

Bottom Box



$\frac{3}{8} > \frac{1}{6}$

Practice

1. a. $\frac{1}{10}$

b. $\frac{5}{6}$

c. $\frac{4}{7}$

2. $\frac{3}{5}$: Half of 5 is $2\frac{1}{2}$.

$\frac{8}{16}$: Half of 16 is 8.

$\frac{6}{16}$: Half of 16 is 8.

$\frac{11}{22}$: Half of 22 is 11.

$\frac{3}{5}$ $\quad$ $\frac{8}{16}$ $\quad$ $\frac{6}{16}$ $\quad$ $\frac{11}{22}$

3. $\frac{5}{12}$: Half of 12 is 6. 5 is less than 6.

$\frac{9}{20}$: Half of 20 is 10. 9 is less than 10.

$\frac{7}{10}$: Half of 10 is 5. 7 is greater than 5.

$\frac{13}{30}$: Half of 30 is 15. 13 is less than 15.

~~$\frac{5}{12}$~~ $\quad$ ~~$\frac{9}{20}$~~ $\quad$ $\frac{7}{10}$ $\quad$ ~~$\frac{13}{30}$~~

4. $\frac{3}{11}$: Half of 11 is $5\frac{1}{2}$. 3 is less than $5\frac{1}{2}$.

$\frac{7}{12}$: Half of 12 is 6. 7 is greater than 6.

$\frac{9}{14}$: Half of 14 is 7. 9 is greater than 7.

$\frac{5}{9}$: Half of 9 is $4\frac{1}{2}$. 5 is greater than $4\frac{1}{2}$.

$\frac{3}{11}$ $\quad$ $\boxed{\frac{7}{12}}$ $\quad$ $\boxed{\frac{9}{14}}$ $\quad$ $\boxed{\frac{5}{9}}$

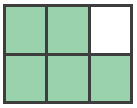
5. $\frac{3}{5}$: Half of 5 is $2\frac{1}{2}$. 3 is greater than $2\frac{1}{2}$, so $\frac{3}{5}$ is greater than $\frac{1}{2}$.

$\frac{2}{4}$: Half of 4 is 2, so $\frac{2}{4}$ is equal to $\frac{1}{2}$.

$\frac{1}{3}$: Half of 3 is $1\frac{1}{2}$. 1 is less than $1\frac{1}{2}$, so $\frac{1}{3}$ is less than $\frac{1}{2}$.

Least to greatest: $\frac{1}{3}, \frac{2}{4}, \frac{3}{5}$

6. Shapes may vary.

a. 

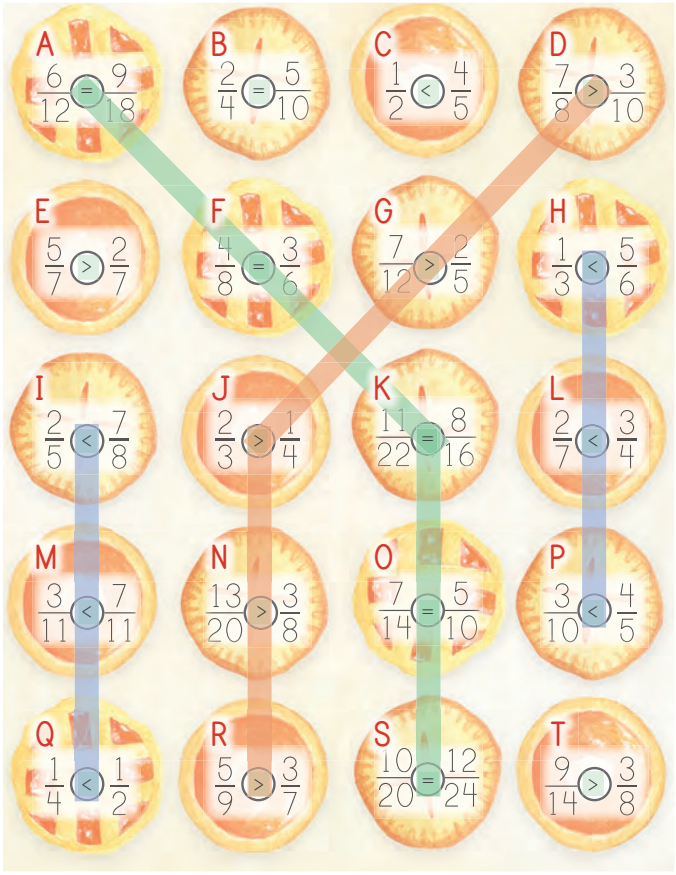
b. 

7. $\frac{3}{4}$  $>$ $\frac{2}{3}$ 

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Spin-a-Pie Game

Green shows three equal fractions.
Orange shows three greater-than comparisons.
Blue shows three less-than comparisons.
Work for each problem is shown below.



A $\frac{6}{12} \bigcirc \frac{9}{18}$

Half of 12 is 6. $\frac{6}{12} = \frac{1}{2}$

Half of 18 is 9. $\frac{9}{18} = \frac{1}{2}$

$\frac{6}{12} = \frac{9}{18}$

B $\frac{2}{4} \bigcirc \frac{5}{10}$

Half of 4 is 2. $\frac{2}{4} = \frac{1}{2}$

Half of 10 is 5. $\frac{5}{10} = \frac{1}{2}$

$\frac{2}{4} = \frac{5}{10}$

C $\frac{1}{2} \bigcirc \frac{4}{5}$

Half of 5 is $2\frac{1}{2}$. 4 is greater than $2\frac{1}{2}$, so $\frac{1}{2} < \frac{4}{5}$.

D $\frac{7}{8} \bigcirc \frac{3}{10}$

Half of 8 is 4. 7 is greater than 4, so $\frac{7}{8} > \frac{1}{2}$.

Half of 10 is 5. 3 is less than 5, so $\frac{3}{10} < \frac{1}{2}$.

$\frac{7}{8} > \frac{3}{10}$

E $\frac{5}{7} \bigcirc \frac{2}{7}$

Half of 7 is $3\frac{1}{2}$. 5 is greater than $3\frac{1}{2}$, so $\frac{5}{7} > \frac{1}{2}$.

Half of 7 is $3\frac{1}{2}$. 2 is less than $3\frac{1}{2}$, so $\frac{2}{7} < \frac{1}{2}$.

$\frac{5}{7} > \frac{2}{7}$

F $\frac{4}{8} \bigcirc \frac{3}{6}$

Half of 8 is 4. $\frac{4}{8} = \frac{1}{2}$

Half of 6 is 3. $\frac{3}{6} = \frac{1}{2}$

$\frac{4}{8} = \frac{3}{6}$

G $\frac{7}{12} \bigcirc \frac{2}{5}$

Half of 12 is 6. 7 is greater than 6, so $\frac{7}{12} > \frac{1}{2}$.

Half of 5 is $2\frac{1}{2}$. 2 is less than $2\frac{1}{2}$, so $\frac{2}{5} < \frac{1}{2}$.

$\frac{7}{12} > \frac{2}{5}$

H $\frac{1}{3} \bigcirc \frac{5}{6}$

Half of 3 is $1\frac{1}{2}$. 1 is less than $1\frac{1}{2}$, so $\frac{1}{3} < \frac{1}{2}$.

Half of 6 is 3. 5 is greater than 3, so $\frac{5}{6} > \frac{1}{2}$.

$\frac{1}{3} < \frac{5}{6}$

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I $\frac{2}{5} \bigcirc \frac{7}{8}$

Half of 5 is $2\frac{1}{2}$. 2 is less than $2\frac{1}{2}$, so $\frac{2}{5} < \frac{1}{2}$.

Half of 8 is 4. 7 is greater than 4, so $\frac{7}{8} > \frac{1}{2}$.

$\frac{2}{5} < \frac{7}{8}$

J $\frac{2}{3} \bigcirc \frac{1}{4}$

Half of 3 is $1\frac{1}{2}$. 2 is greater than $1\frac{1}{2}$, so $\frac{2}{3} > \frac{1}{2}$.

Half of 4 is 2. 1 is less than 2, so $\frac{1}{4} < \frac{1}{2}$.

$\frac{2}{3} > \frac{1}{4}$

K $\frac{11}{22} \bigcirc \frac{8}{16}$

Half of 22 is 11. $\frac{11}{22} = \frac{1}{2}$

Half of 16 is 8. $\frac{8}{16} = \frac{1}{2}$

$\frac{11}{22} = \frac{8}{16}$

L $\frac{2}{7} \bigcirc \frac{3}{4}$

Half of 7 is $3\frac{1}{2}$. 2 is less than $3\frac{1}{2}$, so $\frac{2}{7} < \frac{1}{2}$.

Half of 4 is 2. 3 is greater than 2, so $\frac{3}{4} > \frac{1}{2}$.

$\frac{2}{7} < \frac{3}{4}$

M $\frac{3}{11} \bigcirc \frac{7}{11}$

Half of 11 is $5\frac{1}{2}$. 3 is less than $5\frac{1}{2}$, so $\frac{3}{11} < \frac{1}{2}$.

Half of 11 is $5\frac{1}{2}$. 7 is greater than $5\frac{1}{2}$, so $\frac{7}{11} > \frac{1}{2}$.

$\frac{3}{11} < \frac{7}{11}$

N $\frac{13}{20} \bigcirc \frac{3}{8}$

Half of 20 is 10. 13 is greater than 10, so $\frac{13}{20} > \frac{1}{2}$.

Half of 8 is 4. 3 is less than 4, so $\frac{3}{8} < \frac{1}{2}$.

$\frac{13}{20} > \frac{3}{8}$

O $\frac{7}{14} \bigcirc \frac{5}{10}$

Half of 14 is 7. $\frac{7}{14} = \frac{1}{2}$

Half of 10 is 5. $\frac{5}{10} = \frac{1}{2}$

$\frac{7}{14} = \frac{5}{10}$

P $\frac{3}{10} \bigcirc \frac{4}{5}$

Half of 10 is 5. 3 is less than 5, so $\frac{3}{10} < \frac{1}{2}$.

Half of 5 is $2\frac{1}{2}$. 4 is greater than $2\frac{1}{2}$, so $\frac{4}{5} > \frac{1}{2}$.

$\frac{3}{10} < \frac{4}{5}$

Q $\frac{1}{4} \bigcirc \frac{1}{2}$

Half of 4 is 2. 1 is less than 2, so $\frac{1}{4} < \frac{1}{2}$.

$\frac{1}{4} < \frac{1}{2}$

R $\frac{5}{9} \bigcirc \frac{3}{7}$

Half of 9 is $4\frac{1}{2}$. 5 is greater than $4\frac{1}{2}$, so $\frac{5}{9} > \frac{1}{2}$.

Half of 7 is $3\frac{1}{2}$. 3 is less than $3\frac{1}{2}$, so $\frac{3}{7} < \frac{1}{2}$.

$\frac{5}{9} > \frac{3}{7}$

S $\frac{10}{20} \bigcirc \frac{12}{24}$

Half of 20 is 10. $\frac{10}{20} = \frac{1}{2}$

Half of 24 is 12. $\frac{12}{24} = \frac{1}{2}$

$\frac{10}{20} = \frac{12}{24}$

T $\frac{9}{14} \bigcirc \frac{3}{8}$

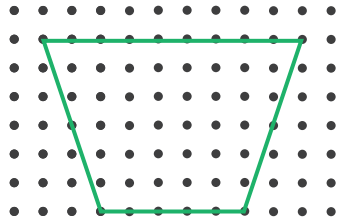
Half of 14 is 7. 9 is greater than 7, so $\frac{9}{14} > \frac{1}{2}$.

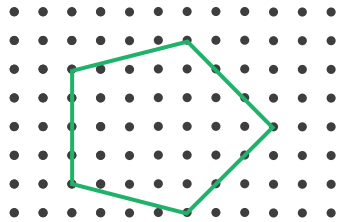
Half of 8 is 4. 3 is less than 4, so $\frac{3}{8} < \frac{1}{2}$.

$\frac{9}{14} > \frac{3}{8}$

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Review

1. 

2. 

3. a. 82 - 5 = 77
   77 - 5 = 72
   72 - 5 = 67
   67 - 5 = 62
   62 - 5 = 57
   57 - 5 = 52

   82, 77, 72, 67, 62, 57, 52
   rule: subtract 5

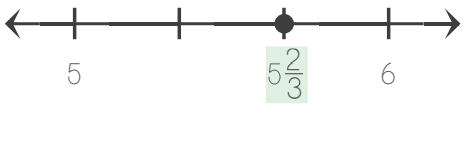
   b. -4 + 1 = -3
   -3 + 1 = -2
   -2 + 1 = -1
   -1 + 1 = 0
   0 + 1 = 1
   1 + 1 = 2

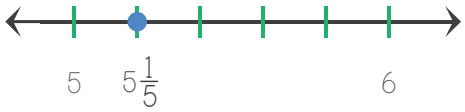
   -4, -3, -2, -1, 0, 1, 2
   rule: add 1

4.
```
    206
32)6,592
  -64
   19
  - 0
   192
  -192
     0
```

NUMBER LINES WITH FRACTIONS AND MIXED NUMBERS

Video Lesson





$5\frac{2}{3} > 5\frac{1}{5}$

Practice

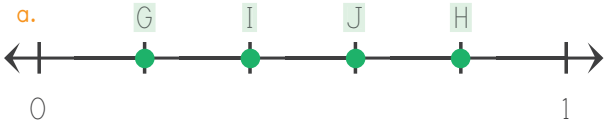
1. This number line is divided into ninths.

A $\frac{1}{9}$ B $\frac{5}{9}$ C $\frac{8}{9}$

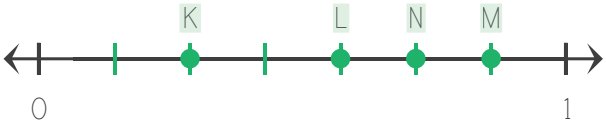
2. This number line is divided into fourths.

D $5\frac{2}{4}$ or $5\frac{1}{2}$ E $6\frac{1}{4}$ F $6\frac{3}{4}$

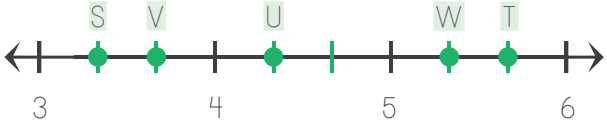
3. a.



b. The student should have drawn six tick marks to create seven sections.



4. The student should have drawn two tick marks (to create three sections) between each pair of whole numbers.



5. a. $\frac{3}{8}$ is farther to the right than $\frac{1}{4}$.

$\frac{3}{8} > \frac{1}{4}$

b. $\frac{1}{2}$ is farther to the left than $\frac{5}{8}$.

$\frac{1}{2} < \frac{5}{8}$

6. The student should have drawn three tick marks (to create four sections) on the first number line.

The student should have drawn eight tick marks (to create nine sections) on the second number line.



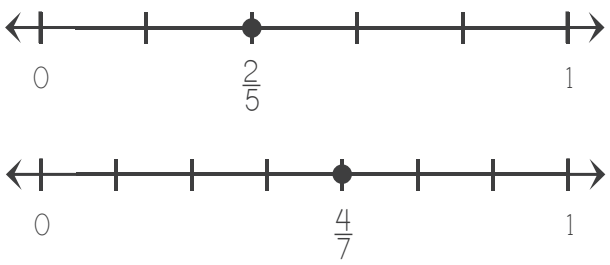


$\frac{3}{4}$ is farther to the right than $\frac{5}{9}$.

You will have eaten more.

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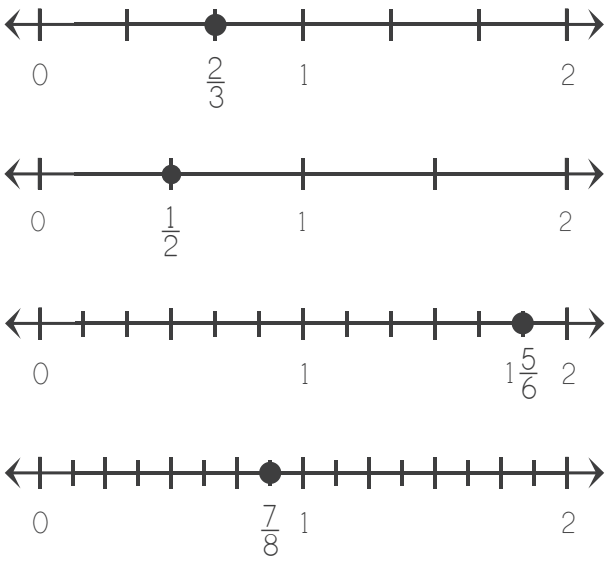
7. Any strategy may be used to solve this problem. Work using number lines is shown below.



$\frac{4}{7}$ is farther to the right than $\frac{2}{5}$.

Jake

8. Any strategy may be used to solve this problem. Work using number lines is shown below.



$\frac{1}{2}$ is farthest to the left.

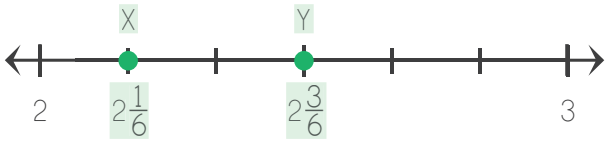
$\frac{2}{3}$ is farther to the right than $\frac{1}{2}$. $\frac{2}{3} > \frac{1}{2}$

$\frac{7}{8}$ is farther to the right than $\frac{2}{3}$. $\frac{7}{8} > \frac{2}{3}$

$1\frac{5}{6}$ is the farthest to the right.

$\frac{1}{2}, \frac{2}{3}, \frac{7}{8}, 1\frac{5}{6}$

9.



10.



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Review

1. a. 1 kg = 1,000 g

b. $72 \times 10^3 = 72{,}000$
72 kg = 72,000 g

c. 1 tn = 2,000 lb

d. 9 × 2,000 = 18,000
9 tn = 18,000 lb

2. ~~D~~ ~~H~~ T ~~W~~ ~~O~~ ~~C~~ V M U

3. least to greatest: 10, 10, 11, 11, 13

10 + 10 + 11 + 11 + 13 = 55
There are 5 numbers.
55 ÷ 5 = 11
mean: 11

10, 10, (11), 11, 13
median: 11

(10, 10), (11, 11), 13
mode: 10 and 11

(10), 10, 11, 11, (13)
13 - 10 = 3
range: 3

4.
$$11\overline{)1{,}111}\quad \text{quotient: } 101$$

5. a. 60 ÷ 5 = A
A = 12

b. 132 ÷ 12 = B

$$12\overline{)13^{1}2}\quad \text{quotient: } 11$$

B = 11

6. $72 \div 8 + (3^2 - 4) =$
$72 \div 8 + (9 - 4) =$
$72 \div 8 + 5 =$
$9 + 5 =$
14

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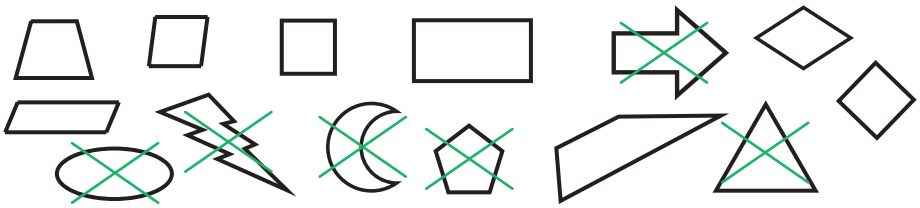
QUADRILATERAL CLASSIFICATION

Video Lesson

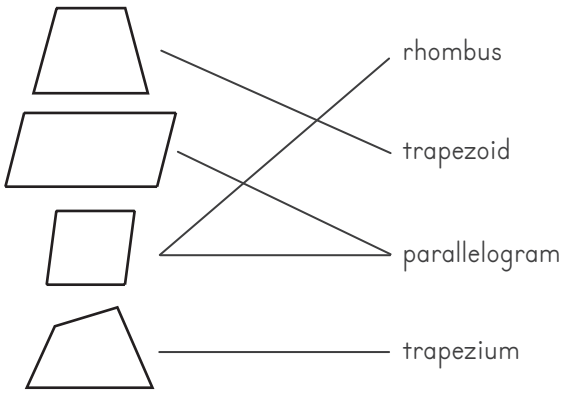
Quadrilateral	Trapezium	Trapezoid	Parallelogram
A, B, C, D, E, F, G	C	A	B, D, E, F, G
Rectangle	**Rhombus**	**Square**	
D, E, F	D, G	D	

Practice

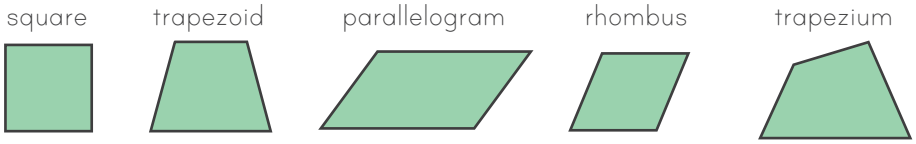
1.



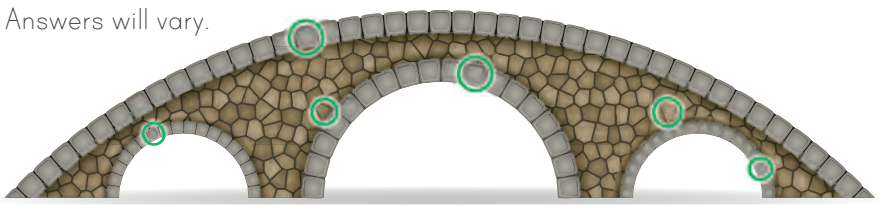
2.



3.



4. Answers will vary.



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5.

Quadrilateral	Trapezium	Trapezoid	Parallelogram
A, B, C, D, E, F	E	A	B, C, D, F
Rectangle	**Rhombus**	**Square**	
C, D	D, F	D	

6. a. trapezium
   b. square
   c. rhombus
   d. trapezoid
   e. rectangle

7. a. ☐ trapezium
   ☑ trapezoid
   ☐ parallelogram
   ☐ rectangle
   ☐ rhombus
   ☐ square

   b. ☐ trapezium
   ☐ trapezoid
   ☑ parallelogram
   ☐ rectangle
   ☑ rhombus
   ☐ square

   c. ☐ trapezium
   ☐ trapezoid
   ☑ parallelogram
   ☑ rectangle
   ☐ rhombus
   ☐ square

   d. ☑ trapezium
   ☐ trapezoid
   ☐ parallelogram
   ☐ rectangle
   ☐ rhombus
   ☐ square

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Review

1. a. $3^3 = 3 \times 3 \times 3 = 27$
$999^0 = 1$
$62^1 = 62$
$15^2 = 15 \times 15 = 225$

b. $\sqrt{121} = 11$
$\sqrt{64} = 8$
$\sqrt{100} = 10$
$\sqrt{144} = 12$

2. a. The exponent is 2. Add 2 zeros after 5,821.
$5{,}821 \times 10^2 = 582{,}100$

b. The exponent is 6. Take 6 zeros off of 210,000,000.
$210{,}000{,}000 \div 10^6 = 210$

3. The number is divisible by 2 because it is even.
6 + 4 + 8 + 0 = 18 18 is divisible by 3, so 6,480 is divisible by 3.
The number formed by the last two digits (80) is divisible by 4, so 6,480 is divisible by 4.
The number is divisible by 5 because it ends in a 0.
The number is divisible by 6 because it is divisible by both 2 and 3.
The sum of the digits (18) is divisible by 9, so 6,480 is divisible by 9.
The number is divisible by 10 because it ends in a 0.

(2) (3) (4) (5) (6) (9) (10)

4. a. 1 ft = 12 in

b. 1 yd = 3 ft
6 ÷ 3 = 2
6 ft = 2 yd

c. 1 cm = 10 mm

d. 1 ft = 12 in
5 × 12 = 60
5 ft = 60 in

e. 1 yd = 3 ft
18 ÷ 3 = 6
18 ft = 6 yd

f. 1 cm = 10 mm
18 × 10 = 180
18 cm = 180 mm

5. $\frac{5}{12}$: Half of 12 is 6. 5 is less than 6.
$\frac{9}{20}$: Half of 20 is 10. 9 is less than 10.
$\frac{8}{16}$: Half of 16 is 8.
$\frac{22}{44}$: Half of 44 is 22.
$\frac{41}{80}$: Half of 80 is 40. 41 is greater than 40.

~~$\frac{5}{12}$~~ ~~$\frac{9}{20}$~~ $\frac{8}{16}$ $\frac{22}{44}$ $\left(\frac{41}{80}\right)$

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PERIMETER AND AREA OF IRREGULAR SHAPES

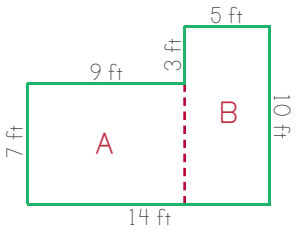
Video Lesson

Top Box

P = 7 ft + 9 ft + 3 ft + 5 ft + 10 ft + 14 ft = 48 ft

perimeter = 48 ft

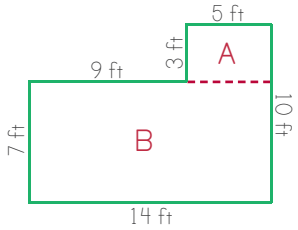
Work may vary. The area is shown using three different methods below.



Area A: 9 ft × 7 ft = 63 ft^2

Area B: 5 ft × 10 ft = 50 ft^2

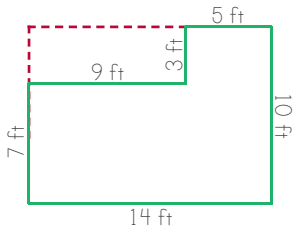
Area of irregular shape: 63 ft^2 + 50 ft^2 = 113 ft^2



Area A: 5 ft × 3 ft = 15 ft^2

Area B: 14 ft × 7 ft = 98 ft^2

Area of irregular shape: 15 ft^2 + 98 ft^2 = 113 ft^2



Area of large rectangle: 14 ft × 10 ft = 140 ft^2

Area of the empty space: 9 ft × 3 ft = 27 ft^2

Area of irregular shape: 140 ft^2 - 27 ft^2 = 113 ft^2

area = 113 ft^2

Bottom Box

Length of the blue side: 3 ft + 4 ft = 7 ft

Length of the purple side: __ ft + 5 ft = 10 ft

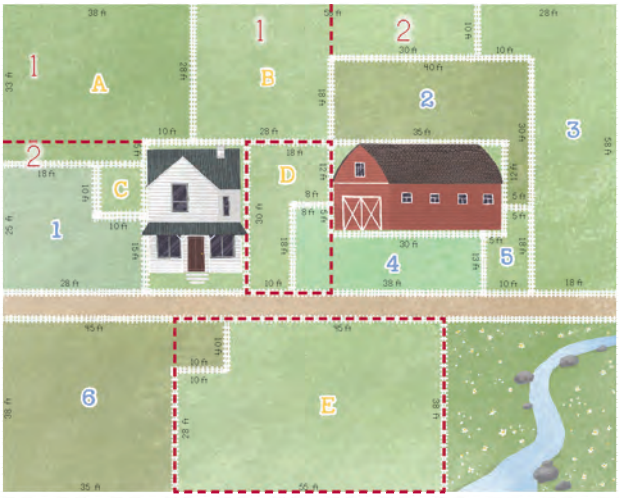
10 ft - 5 ft = 5 ft

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Practice

Find the Areas

The area of irregular shapes may be calculated in different ways. The work shown below is based on how the shapes are split in the picture.



A: Area 1 (top rectangle):
38 ft × 28 ft = 1,064 ft^2

Area 2 (bottom rectangle):
Length of bottom side: 38 ft - 10 ft = 28 ft
28 ft × 5 ft = 140 ft^2

Area A: 1,064 ft^2 + 140 ft^2 = 1,204 ft^2

B: Area 1 (left rectangle):
Length of right side: 18 ft + 10 ft = 28 ft
28 ft × 28 ft = 784 ft^2

Area 2 (right rectangle):
30 ft × 10 ft = 300 ft^2

Area B: 784 ft^2 + 300 ft^2 = 1,084 ft^2

C: 10 ft × 10 ft = 100 ft^2

D: Area of large rectangle:
18 ft × 30 ft = 540 ft^2

Area of the empty space:
18 ft × 8 ft = 144 ft^2

Area D: 540 ft^2 - 144 ft^2 = 396 ft^2

E: Area of large rectangle:
55 ft × 38 ft = 2,090 ft^2

Area of the empty space:
10 ft × 10 ft = 100 ft^2

Area E: 2,090 ft^2 - 100 ft^2 = 1,990 ft^2

Find the Perimeters

The side lengths may be added in any order.

1: P = 18 ft + 10 ft + 10 ft + 15 ft + 28 ft + 25 ft
= 106 ft

2: P = 40 ft + 30 ft + 5 ft + 12 ft + 35 ft + 18 ft
= 140 ft

3: Length of left side: 30 ft + 18 ft = 48 ft

P = 28 ft + 58 ft + 18 ft + 48 ft + 10 ft + 10 ft
= 172 ft

4: P = 8 ft + 5 ft + 30 ft + 13 ft + 38 ft + 18 ft
= 112 ft

5: Length of left side: 18 ft - 13 ft = 5 ft

P = 5 ft + 18 ft + 10 ft + 13 ft + 5 ft + 5 ft
= 56 ft

6: P = 45 ft + 10 ft + 10 ft + 28 ft + 35 ft + 38 ft
= 166 ft

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Clues:

The pigs belong in the shape with a perimeter of 56 ft.
5

Alfalfa grows in the shape with an area of 1,204 ft^2.
A

There is an orchard with an area of 1,084 ft^2.
B

The llamas have a fence with a perimeter of 166 ft.
6

Horses roam in a perimeter of 140 ft.
2

The fence for the goats has a perimeter of 112 ft.
4

The family garden has an area of 396 ft^2.
D

You can find chickens in an area of 100 ft^2.
C

Oats grow in an area of 1,990 ft^2.
E

Cows are in a pasture with a perimeter of 172 ft.
3

Sheep are within a perimeter of 106 ft.
1

Correct placement of the stickers is shown below.

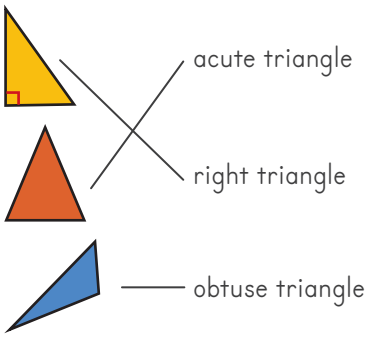


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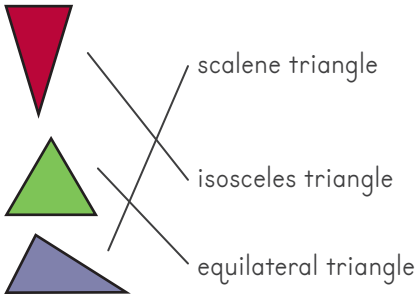
TRIANGLES REVIEW

Practice

1.



2.



3. a. The triangle should have three acute angles and all sides of the same length.



b. The triangle should have a right angle and two sides of the same length.



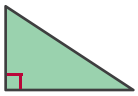
c. The triangle should have an obtuse angle and three sides of different lengths.



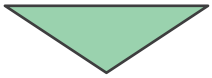
d. The triangle should have three acute angles and two sides of the same length.



e. The triangle should have a right angle and three sides of different lengths.



f. The triangle should have an obtuse angle and two sides of the same length.



4. a. P = 3 yd + 4 yd + 5 yd = 12 yd

b. P = 22 in + 28 in + 28 in = 78 in

c. P = 16 m + 16 m + 16 m = 48 m

5. a. $A = \frac{7\text{ yd} \times 10\text{ yd}}{2} = \frac{70\text{ yd}^2}{2} = 35\text{ yd}^2$

b. $A = \frac{20\text{ ft} \times 9\text{ ft}}{2} = \frac{180\text{ ft}^2}{2} = 90\text{ ft}^2$

c. $A = \frac{24\text{ m} \times 12\text{ m}}{2} = \frac{288\text{ m}^2}{2} = 144\text{ m}^2$

6. Hexagons have six sides. Since this is an equilateral hexagon, each of the sides are the same length.
36 cm ÷ 6 = 6 cm
Each side of the equilateral hexagon is 6 cm.

a. There are 18 sides on the outside of this figure.
perimeter = 18 × 6 cm = 108 cm

b. There are 46 sides on the outside of this figure.
perimeter = 46 × 6 cm = 276 cm

c. There are 14 sides on the outside of this figure.
perimeter = 14 × 6 cm = 84 cm

d. There are 30 sides on the outside of this figure.
perimeter = 30 × 6 cm = 180 cm

e. There are 38 sides on the outside of this figure.
perimeter = 38 × 6 cm = 228 cm

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NUMBERS IN THE BILLIONS AND ORDINAL NUMBERS

Video Lesson

Top Box:

$$\begin{array}{r} {\scriptstyle 1\ 2\ \ \ \ \ \ \ \ } \\ 323{,}000{,}000 \\ 378{,}000{,}000 \\ +\ 359{,}000{,}000 \\ \hline 1{,}060{,}000{,}000 \end{array}$$

Standard form: 1,060,000,000
Word form: one billion, sixty million
Expanded form: 1,000,000,000 + 60,000,000

Bottom Box:

seventy-seventh
forty-first
ninetieth

Practice

1.

Billions			Millions			Thousands			Ones		
Hundred Billions	Ten Billions	Billions	Hundred Millions	Ten Millions	Millions	Hundred Thousands	Ten Thousands	Thousands	Hundreds	Tens	Ones
2	4	8,	7	9	4,	3	1	6,	9	5	2

2. four hundred eighty-two billion, eighty-four million, one hundred ninety-seven thousand, six hundred two

3. a. 76,952,301,408

b. 322,159,832,420

4. a. eighty-first

b. one hundredth

5. a.

$$\begin{array}{r} {\scriptstyle 1\ 1\ \ \ \ \ } \\ 95{,}603 \\ \times\ \ \ \ 12 \\ \hline {\scriptstyle 1\ \ \ \ \ \ } \\ 191206 \\ +\ 956030 \\ \hline 1{,}147{,}236 \end{array}$$

1,147,236 bees

b. ants in first two colonies:

$$\begin{array}{r} {\scriptstyle \ \ \ \ \ \ 1\ \ \ \ \ \ } \\ 9{,}760{,}327 \\ +\ 10{,}004{,}213 \\ \hline 19{,}764{,}540 \end{array}$$

ants in third colony:

$$\begin{array}{r} {\scriptstyle 1\ 17\ 16\ \ \ \ \ \ } \\ \not{2}\not{8}{,}\not{7}{}^{1}56{,}656 \\ -\ 19{,}764{,}540 \\ \hline 8{,}992{,}116 \end{array}$$

8,992,116 ants

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c.
$$\begin{array}{r} 1{,}800 \\ \times\ 110 \\ \hline 0000 \\ 18000 \\ +\ 180000 \\ \hline 198{,}000 \end{array}$$

198,000 miles^2

d. From part c, the swarm contained 120 billion locusts.

120 billion ÷ 5 = 24 billion

24 billion locusts

e. 20 dragonflies have 40 eyes.

$$\begin{array}{r} 30{,}000 \\ \times\ 40 \\ \hline 00000 \\ +1\,200000 \\ \hline 1{,}200{,}000 \end{array}$$

1,200,000 lenses

6. a. 3

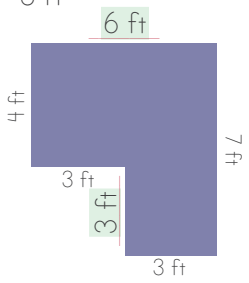
b. 7

c. ten millions: 8
billions: 9
hundred millions: 7
ten billions: 3

7. tiny egg: 64th
blade of grass: 51st
white flower petal: 39th
grain: 88th
crumb of bread: 75th

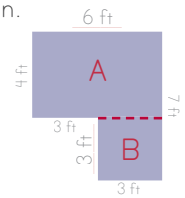
Review

1. a. top side: 3 ft + 3 ft = 6 ft
left side: __ ft + 4 ft = 7 ft
7 ft - 4 ft = 3 ft



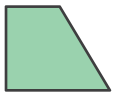
b. perimeter = 6 ft + 7 ft + 3 ft + 3 ft + 3 ft + 4 ft = 26 ft

c. The area may be calculated in different ways. The work below is based on the figure being split as shown.



Area A: 6 ft × 4 ft = 24 ft^2
Area B: 3 ft × 3 ft = 9 ft^2
Area of irregular shape: 24 ft^2 + 9 ft^2 = 33 ft^2

2. a. The figure should have one pair of parallel sides.



b. The figure should have two pairs of parallel sides.



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LOGIC PUZZLES AND GAMES

Practice

5 Snowy Toes

Answers will vary. Examples are given.

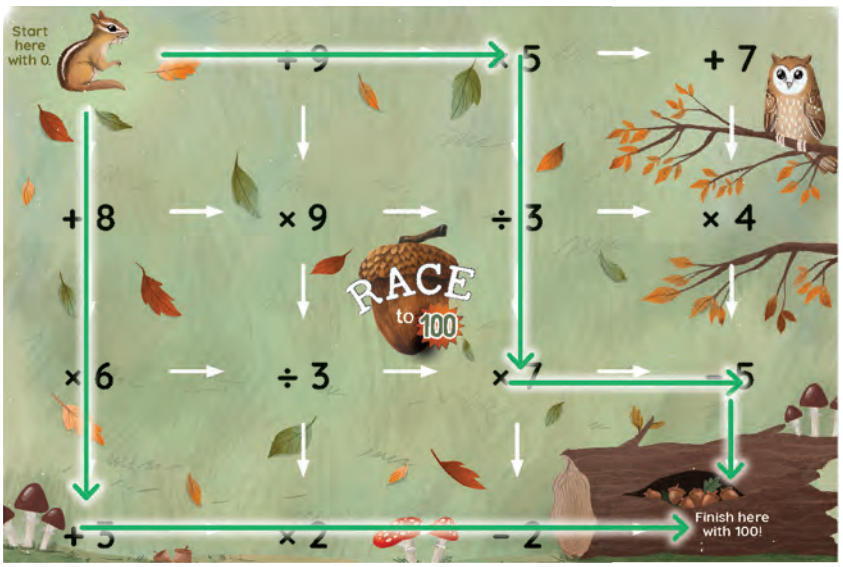
5 - 5 = 0	5 + (5 ÷ 5) = 6	5 + 5 + (5 ÷ 5) + (5 ÷ 5) = 12
5 ÷ 5 = 1	5 + (5 ÷ 5) + (5 ÷ 5) = 7	5 + 5 + 5 - (5 ÷ 5) - (5 ÷ 5) = 13
(5 + 5) ÷ 5 = 2	5 + 5 - (5 ÷ 5) - (5 ÷ 5) = 8	5 + 5 + 5 - (5 ÷ 5) = 14
(5 + 5 + 5) ÷ 5 or (5 ÷ 5) + (5 ÷ 5) + (5 ÷ 5) = 3	5 + 5 - (5 ÷ 5) = 9	5 + 5 + 5 = 15
5 - (5 ÷ 5) = 4	5 + 5 = 10	
5 × 5 ÷ 5 = 5	5 + 5 + (5 ÷ 5) = 11	

Snowy Toes Key

0 badger	8 opossum
1 weasel	9 coati
2 wolverine	10 mink
3 raccoon	11 grizzly bear
4 skunk	12 ringtail
5 polar bear	13 ermine
6 kinkajou	14 black bear
7 otter	15 beaver

Race to 100

Two possible routes are shown.



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Picture Problems

1. a.  =

This means that  +  +  = 24.

8 + 8 + 8 = 24

 = 8

 = 8

 ×  = 16

8 ×  = 16

8 × 2 = 16

 = 2

b.  ×  ×  = 64

4 × 4 × 4 = 64

 = 4

 ÷  = 

 ÷  = 4

Also,  ×  = 100.

Guess and check to find two numbers whose quotient is 4 and whose product is 100. Start with numbers that give a product of 100.

Try  = 25 and  = 4.

25 × 4 = 100, but 25 ÷ 4 ≠ 4.

Try  = 10 and  = 10.

10 × 10 = 100, but 10 ÷ 10 ≠ 4.

Try  = 20 and  = 5.

20 × 5 = 100, and 20 ÷ 5 = 4.

 = 20

 = 5

c. 12 -  = 

12 - 6 = 6

 = 6

 +  ×  = 62

 + 6 ×  = 62

 ÷  = 5

 must be a multiple of 5.

Guess and check. Try = 10.

10 ÷ = 5

10 ÷ 2 = 5

Therefore if = 10, then = 2. Try both in the first equation.

2 + 6 × 10 =

2 + 60 =

62 ✓

 = 10

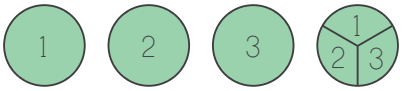
 = 2

2.

QUOTIENTS AS MIXED NUMBERS

Video Lesson

Top Box



$1\frac{1}{3}$

Middle Box

$7\frac{1}{3}$

Bottom Box

$$\begin{array}{r} 2 \text{ R5} \\ 6\overline{)17} \\ -12 \\ \hline 5 \end{array}$$

$2\frac{5}{6}$

Practice

1. a. (given)

b. $\frac{2}{3}$

c. $\frac{5}{9}$

d. $\frac{4}{7}$

e. $\frac{3}{11}$

f. $\frac{8}{9}$

g. $\frac{9}{13}$

h. $\frac{7}{10}$

2. a. (given)

b. $8\frac{3}{8}$

c. $11\frac{1}{11}$

d. $30\frac{9}{10}$

3. a.
$$\begin{array}{r} 2\frac{4}{5} \\ 5\overline{)14} \\ -10 \\ \hline 4 \end{array}$$

b.
$$\begin{array}{r} 14\frac{2}{9} \\ 9\overline{)128} \\ -\ 9 \\ \hline 38 \\ -36 \\ \hline 2 \end{array}$$

c.
$$\begin{array}{r} 12\frac{5}{12} \\ 12\overline{)149} \\ -12 \\ \hline 29 \\ -24 \\ \hline 5 \end{array}$$

d.
$$\begin{array}{r} 12\frac{1}{20} \\ 20\overline{)241} \\ -20 \\ \hline 41 \\ -40 \\ \hline 1 \end{array}$$

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4. a.



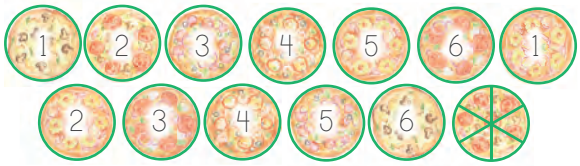
$1\frac{1}{2}$ tarts

b.



$1\frac{2}{3}$ granola bars

c.



$2\frac{1}{6}$ pizzas

5. a. (given)

b. $3\overline{)5}\ 1\frac{2}{3}$

-3

2

$1\frac{2}{3}$ granola bars

c. $6\overline{)13}\ 2\frac{1}{6}$

-12

1

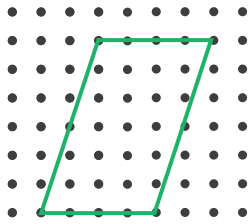
$2\frac{1}{6}$ pizzas

Review

1. a. 6, 12, 18, 24, 30, 36, 42, 48

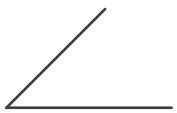
b. 12, 24, 36, 48, 60, 72, 84, 96

2.



Answers may vary.

3. Angle orientation and placement may vary, but the measure should be 45°.



4. 105°

Student answer may differ by a few degrees.

5. ΔPMT, ΔMTP, ΔTPM, ΔPTM, ΔTMP, ΔMPT

6. perimeter = 5 ft + 12 ft + 13 ft = 30 ft

$$\text{area} = \frac{5\text{ ft} \times 12\text{ ft}}{2} = \frac{60\text{ ft}^2}{2} = 30\text{ ft}^2$$

7. a. $5 \times 44 \times 2 =$
$5 \times 2 \times 44 =$
$10 \times 44 =$
440

b. $34 \times 2 \times 50 =$
$34 \times 100 =$
3,400

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ADDING AND SUBTRACTING WITH COMMON DENOMINATORS

Video Lesson

Top Box:



4, 8, 12, 16, 20, 24, 28, 32, 36, 40

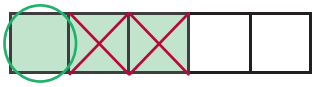


9, 18, 27, 36, 45, 54, 63, 72, 81, 90

LCM: 36

Bottom Box:

$\frac{3}{5} - \frac{2}{5} = \frac{1}{5}$

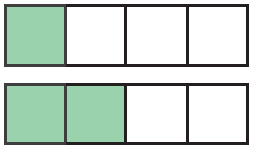


Practice

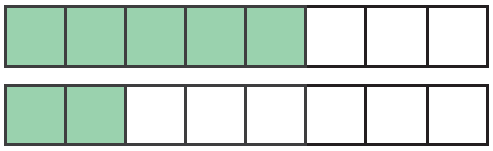
1. a. $\frac{1}{9}$, $\frac{8}{11}$, $\frac{3}{4}$, $\frac{2}{9}$, $\frac{4}{7}$, $\frac{7}{8}$, $\frac{1}{5}$, $\frac{5}{9}$

b. $\frac{9}{14}$, $\frac{12}{13}$, $\frac{6}{11}$, $\frac{11}{13}$, $\frac{3}{4}$, $\frac{7}{9}$, $\frac{10}{13}$, $\frac{4}{5}$

2. a. $\frac{1}{4} + \frac{2}{4} = \frac{3}{4}$



b. $\frac{5}{8} + \frac{2}{8} = \frac{7}{8}$



3. a. $\frac{3}{7} + \frac{2}{7} = \frac{5}{7}$

b. $\frac{7}{8} - \frac{4}{8} = \frac{3}{8}$

c. $\frac{7}{20} + \frac{10}{20} = \frac{17}{20}$

d. $\frac{13}{14} - \frac{8}{14} = \frac{5}{14}$

e. $\frac{3}{10} + \frac{4}{10} = \frac{7}{10}$

f. $\frac{12}{17} - \frac{2}{17} = \frac{10}{17}$

4. a. LCM of 3 and 4: 12
3: 3, 6, 9, 12, 15
4: 4, 8, 12, 16, 20

b. LCM of 6 and 10: 30
6: 6, 12, 18, 24, 30
10: 10, 20, 30, 40, 50

c. LCM of 3 and 5: 15
3: 3, 6, 9, 12, 15
5: 5, 10, 15, 20, 25

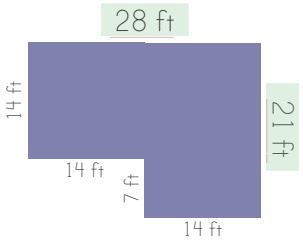
d. LCM of 7 and 8: 56
7: 7, 14, 21, 28, 35, 42, 49, 56
8: 8, 16, 24, 32, 40, 48, 56

e. LCM of 2 and 4: 4
2: 2, 4, 6, 8, 10
4: 4, 8, 12, 16, 20

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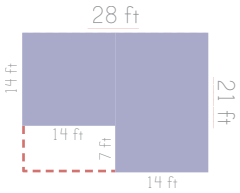
Review

1. a. Length of top side: 14 ft + 14 ft = 28 ft
Length of right side: 14 ft + 7 ft = 21 ft



Perimeter = 28 ft + 21 ft + 14 ft + 7 ft + 14 ft + 14 ft = 98 ft

The area may be calculated in different ways. The work below is based on the figure being split as shown.

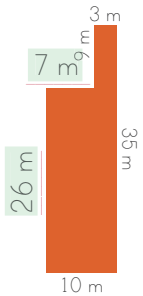


Area of large rectangle:
28 ft × 21 ft = 588 ft^2

Area of the empty space:
14 ft × 7 ft = 98 ft^2

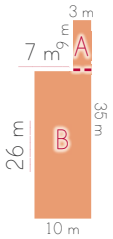
Area of irregular shape:
Area = 588 ft^2 - 98 ft^2 = 490 ft^2

b. Length of top side: 10 m - 3 m = 7 m
Length of left side: 35 m - 9 m = 26 m



Perimeter = 3 m + 35 m + 10 m + 26 m + 7 m + 9 m = 90 m

The area may be calculated in different ways. The work below is based on the figure being split as shown.



Area A: 9 m × 3 m = 27 m^2

Area B: 10 m × 26 m = 260 m^2

Area of irregular shape: 27 m^2 + 260 m^2 = 287 m^2

2. a.
- ☐ trapezium
- ☐ trapezoid
- ☑ parallelogram
- ☑ rectangle
- ☑ rhombus
- ☑ square

b.
- ☐ trapezium
- ☐ trapezoid
- ☑ parallelogram
- ☐ rectangle
- ☐ rhombus
- ☐ square

3. least to greatest: 8, 10, 12, 13, 32

8 + 10 + 12 + 13 + 32 = 75
There are five numbers.
75 ÷ 5 = 15
mean: 15

8, 10, (12), 13, 32
median: 12

8, 10, 12, 13, 32
mode: none

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8, 10, 12, 13, 32
32 - 8 = 24
range: 24

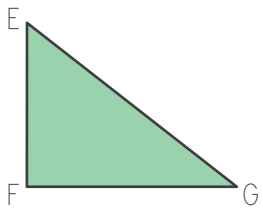
4. a. 3 - 3 = 0
0 - 3 = -3
-3 - 3 = -6
-6 - 3 = -9
-9 - 3 = -12
-12 - 3 = -15

3, 0, -3, -6, -9, -12, -15
rule: subtract 3

b. 7 + 7 = 14
14 + 7 = 21
21 + 7 = 28
28 + 7 = 35
35 + 7 = 42
42 + 7 = 49

7, 14, 21, 28, 35, 42, 49
rule: add 7

5. Answers may vary. An example is given.



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FRACTIONS AND ONE WHOLE

Video Lesson

Top Box

$\frac{4}{9} + \frac{2}{9} + \frac{3}{9} = \frac{9}{9} = 1$

Bottom Left Box

$1 - \frac{3}{8} = \frac{8}{8} - \frac{3}{8} = \frac{5}{8}$

Bottom Right Box

$1 - \frac{5}{6} = \frac{6}{6} - \frac{5}{6} = \frac{1}{6}$

Practice

1. a. $\frac{4}{4}$

b. $\frac{8}{8}$

c. $\frac{100}{100}$

2. a. $\frac{2}{5} + \frac{1}{5} = \frac{3}{5}$

$\frac{3}{5} + \frac{1}{5} = \frac{4}{5}$

$\frac{4}{5} + \frac{1}{5} = \frac{5}{5} = 1$

$\frac{3}{5}$ $\frac{4}{5}$ 1

b. $\frac{8}{11} + \frac{3}{11} = \frac{11}{11} = 1$

$\frac{3}{11} + \frac{3}{11} = \frac{6}{11}$

$\frac{6}{11} + \frac{3}{11} = \frac{9}{11}$

1 $\frac{6}{11}$ $\frac{9}{11}$

3. a. (given)

b. $1 - \frac{1}{6} = \frac{6}{6} - \frac{1}{6} = \frac{5}{6}$

c. $1 - \frac{5}{12} = \frac{12}{12} - \frac{5}{12} = \frac{7}{12}$

d. $1 - \frac{3}{8} = \frac{8}{8} - \frac{3}{8} = \frac{5}{8}$

e. $1 - \frac{17}{20} = \frac{20}{20} - \frac{17}{20} = \frac{3}{20}$

f. $1 - \frac{3}{11} = \frac{11}{11} - \frac{3}{11} = \frac{8}{11}$

4. a. $\frac{14}{14} = 1$

b. $\frac{1}{6} + \frac{5}{6} = \frac{6}{6} = 1$

$1 = \frac{1}{6} + \frac{5}{6}$

c. $1 - \frac{10}{11} = \frac{11}{11} - \frac{10}{11} = \frac{1}{11}$

Half of 11 is $5\frac{1}{2}$. 1 is less than $5\frac{1}{2}$.

$\frac{1}{11} < \frac{1}{2}$

$1 - \frac{10}{11} < \frac{1}{2}$

d. $1 + \frac{9}{9} = 1 + 1 = 2$

$1 + \frac{9}{9} = 2$

e. $1 - \frac{1}{7} = \frac{7}{7} - \frac{1}{7} = \frac{6}{7}$

$\frac{12}{12} = 1$

$\frac{6}{7} < 1$

$1 - \frac{1}{7} < \frac{12}{12}$

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f. $1 - \frac{1}{5} = \frac{5}{5} - \frac{1}{5} = \frac{4}{5}$

Half of 5 is $2\frac{1}{2}$. 4 is greater than $2\frac{1}{2}$.

$1 - \frac{4}{7} = \frac{7}{7} - \frac{4}{7} = \frac{3}{7}$

Half of 7 is $3\frac{1}{2}$. 3 is less than $3\frac{1}{2}$.

$\frac{4}{5} > \frac{3}{7}$

$1 - \frac{1}{5} > 1 - \frac{4}{7}$

5. a. $\frac{5}{6}$: Half of 6 is 3. 5 is greater than 3, so $\frac{5}{6} > \frac{1}{2}$.

$\frac{1}{3}$: Half of 3 is $1\frac{1}{2}$. 1 is less than $1\frac{1}{2}$, so $\frac{1}{3} < \frac{1}{2}$.

greatest to least: $1, \frac{5}{6}, \frac{1}{2}, \frac{1}{3}$

b. $\frac{7}{16}$: Half of 16 is 8. 7 is less than 8, so $\frac{7}{16} < \frac{1}{2}$.

$\frac{2}{3}$: Half of 3 is $1\frac{1}{2}$. 2 is greater than $1\frac{1}{2}$, so $\frac{2}{3} > \frac{1}{2}$.

greatest to least: $1, \frac{2}{3}, \frac{1}{2}, \frac{7}{16}$

6. a. $1 - \frac{3}{4} = \frac{4}{4} - \frac{3}{4} = \frac{1}{4}$

$\frac{1}{4}$ of the books

b. $1 - \frac{1}{3} = \frac{3}{3} - \frac{1}{3} = \frac{2}{3}$

$\frac{2}{3}$ of the shells

c. $1 - \frac{2}{5} = \frac{5}{5} - \frac{2}{5} = \frac{3}{5}$

$\frac{3}{5}$ of the time

tails

7. a. $\frac{1}{8} + \frac{2}{8} + \frac{4}{8} = \frac{7}{8}$

b. $\frac{1}{12} + \frac{2}{12} + \frac{2}{12} + \frac{1}{12} = \frac{6}{12} = \frac{1}{2}$

c. $\frac{1}{20} + \frac{2}{20} + \frac{1}{20} + \frac{1}{20} + \frac{2}{20} + \frac{2}{20} + \frac{1}{20} = \frac{10}{20} = \frac{1}{2}$

Review

1. 4: 4, 8, 12, 16, 20, (24)
6: 6, 12, 18, (24), 30
8: 8, 16, (24), 32, 40

LCM: 24

2. ∠A: 87°, ∠B: 93°

Student answers may differ by a few degrees.

3. A: $3\frac{2}{3}$

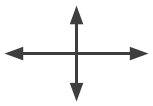
B: $4\frac{1}{3}$

C: $4\frac{2}{3}$

D: $5\frac{2}{3}$

4. a. 

b. 

c. 

d.

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FAHRENHEIT AND CELSIUS

Video Lesson

Left Box

C = (F - 32) × 5 ÷ 9
C = (41 - 32) × 5 ÷ 9
C = 9 × 5 ÷ 9
C = 45 ÷ 9
C = 5

41 °F = 5 °C

Right Box

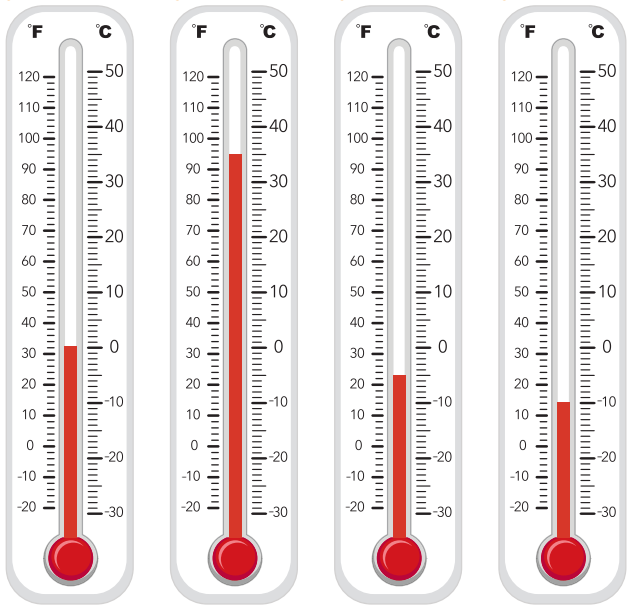
F = 9C ÷ 5 + 32
F = 9 × 35 ÷ 5 + 32
F = 315 ÷ 5 + 32
F = 63 + 32
F = 95

35 °C = 95 °F

Practice

1.
a. 41 °F, 5 °C
b. 77 °F, 25 °C
c. 50 °F, 10 °C
d. 113 °F, 45 °C

2.
a. b. c. d.



32 °F 35 °C 23 °F -10 °C

3.
a. 10 °F 28 °C
b. -12 °C 20 °C
c. 35 °C 24 °F
d. 0 °C 30 °C

4.
a. -2 °C ~~0 °C~~
b. ~~-24 °F~~ -32 °F
c. ~~0 °C~~ 0 °F
d. 30 °F ~~0 °C~~

5.
a. 32 °F = 0 °C
b. 9:00 PM: 12 °C
10:00 PM: 12 °C - 4 °C = 8 °C
11:00 PM: 8 °C - 4 °C = 4 °C
12:00 AM (midnight): 4 °C - 4 °C = 0 °C

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6. a. $C = (F - 32) \times 5 \div 9$
$C = (50 - 32) \times 5 \div 9$
$C = 18 \times 5 \div 9$
$C = 90 \div 9$
$C = 10$

50 °F = 10 °C

b. $C = (F - 32) \times 5 \div 9$
$C = (104 - 32) \times 5 \div 9$
$C = 72 \times 5 \div 9$
$C = 360 \div 9$
$C = 40$

104 °F = 40 °C

7. a. $F = 9C \div 5 + 32$
$F = 9 \times 45 \div 5 + 32$
$F = 405 \div 5 + 32$
$F = 81 + 32$
$F = 113$

45 °C = 113 °F

b. $F = 9C \div 5 + 32$
$F = 9 \times 30 \div 5 + 32$
$F = 270 \div 5 + 32$
$F = 54 + 32$
$F = 86$

30 °C = 86 °F

Review

1. a. $\frac{1}{4} + \frac{3}{4} = \frac{4}{4} = 1$

b. $1 - \frac{3}{5} = \frac{5}{5} - \frac{3}{5} = \frac{2}{5}$

c. $1 + \frac{8}{8} = 1 + 1 = 2$

d. $\frac{2}{16} + \frac{1}{16} + \frac{6}{16} + \frac{2}{16} + \frac{3}{16} + \frac{2}{16} = \frac{16}{16} = 1$

2. a. $\sqrt{225} = 15$

b. $\sqrt{81} = 9$

c. $\sqrt{196} = 14$

3. a. 51 rounds to ⟶ 50
294 rounds to ⟶ 300

50 × 300 = 15,000

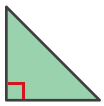
51 × 294 ≈ 15,000

b. 786 rounds to ⟶ 800
17 rounds to ⟶ 20

$$20\overline{)800}\quad 40$$

786 ÷ 17 ≈ 40

4. The triangle should have a right angle and two sides of the same length.



5. twenty-eighth, twenty-ninth, thirtieth, thirty-first, thirty-second, thirty-third

6. a.
$$\begin{array}{r} 213\frac{1}{8} \\ 8\overline{)1,705} \\ -16 \\ \hline 10 \\ -8 \\ \hline 25 \\ -24 \\ \hline 1 \end{array}$$

b.
$$\begin{array}{r} 25\frac{5}{12} \\ 12\overline{)305} \\ -24 \\ \hline 65 \\ -60 \\ \hline 5 \end{array}$$

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MIXED NUMBERS AND WHOLE NUMBERS GREATER THAN 1

Video Lesson

Top Box

$2\frac{1}{5} + 5\frac{4}{5} =$

$7 + \frac{5}{5} =$

8

Bottom Box

$12 - \frac{2}{3} =$

$11\frac{3}{3} - \frac{2}{3}$

$= 11\frac{1}{3}$

Practice



1. $2\frac{1}{4} + 3\frac{2}{4} =$

$5\frac{3}{4}$

This is clue **b**. Write "deer" by the lake.

2. $8\frac{1}{4} + 3\frac{1}{4} =$

$11\frac{2}{4} =$

$11\frac{1}{2}$

This is clue **b**. Write "chipmunk" by the log.

3. $5\frac{1}{3} + 4\frac{2}{3} =$

$9\frac{3}{3} =$

10

This is clue **b**. Write "nuthatches" by the oak trees.

4. $14\frac{2}{5} + 15\frac{3}{5} =$

$29\frac{5}{5} =$

30

This is clue **b**. Write "raccoon" by the hollow tree.

5. $9 - \frac{4}{7} =$

$8\frac{7}{7} - \frac{4}{7} =$

$8\frac{3}{7}$

This is clue **a**.

$\frac{1}{12} + \frac{3}{12} = \frac{4}{12} = \frac{1}{3}$

Write "$\frac{1}{3}$" by the deer's home.

6. $15 - \frac{10}{11} =$

$14\frac{11}{11} - \frac{10}{11} =$

$14\frac{1}{11}$

This is clue **a**.

$\frac{11}{12} - \frac{10}{12} = \frac{1}{12}$

Write "$\frac{1}{12}$" by the nuthatches' home.

7. $9 - 1\frac{1}{2} =$

$8\frac{2}{2} - 1\frac{1}{2} =$

$7\frac{1}{2}$

This is clue **a**.

$\frac{5}{12} - \frac{3}{12} = \frac{2}{12} = \frac{1}{6}$

Write "$\frac{1}{6}$" by the chipmunk's home.

8. $13 - 1\frac{5}{6} =$

$12\frac{6}{6} - 1\frac{5}{6} =$

$11\frac{1}{6}$

This is clue **b**.

$\frac{1}{12} + \frac{2}{12} = \frac{3}{12} = \frac{1}{4}$

Write "$\frac{1}{4}$" by the raccoon's home.

9. $\frac{1}{3} + \frac{1}{12} + \frac{1}{6} + \frac{1}{4} =$

$\frac{4}{12} + \frac{1}{12} + \frac{2}{12} + \frac{3}{12} = \frac{10}{12} = \frac{5}{6}$

10. no

K N K U S

11. $18 - 3\frac{2}{9} =$

$17\frac{9}{9} - 3\frac{2}{9} =$

$14\frac{7}{9}$

(K)

12. $12\frac{5}{8} + 8\frac{2}{8} =$

$20\frac{7}{8}$

(N)

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13. $32\frac{1}{4} + 25\frac{1}{4} =$

$57\frac{2}{4} =$

$57\frac{1}{2}$

(K)

14. $11\frac{2}{7} + 3\frac{5}{7} =$

$14\frac{7}{7} =$

15

(U)

15. $16 - \frac{7}{10} =$

$15\frac{10}{10} - \frac{7}{10} =$

$15\frac{3}{10}$

(S)

16. S K U N K

17. $20 - \frac{8}{17} =$

$19\frac{17}{17} - \frac{8}{17} =$

$19\frac{9}{17}$

This is clue **a**. Write "skunk" by the hole above the house.

18. $1 - \frac{10}{12} = \frac{12}{12} - \frac{10}{12} = \frac{2}{12} = \frac{1}{6}$

19. $\frac{1}{3} + \frac{1}{12} + \frac{1}{6} + \frac{1}{4} + \frac{1}{6} =$

$\frac{4}{12} + \frac{1}{12} + \frac{2}{12} + \frac{3}{12} + \frac{2}{12} = \frac{12}{12} = 1$

20. yes

PLACE VALUE WITH DECIMALS

Video Lesson

Top Left Box

hundredth
thousandth
tenth

Top Right Box

41.358 sec

Bottom Box

$60 + 9 + \frac{5}{10} + \frac{2}{100} + \frac{8}{1{,}000}$

$60 + 9 + 0.5 + 0.02 + 0.008$

Practice

1. a. hundred millions

b. billions

c. tenths

2. 607,296,314,587.439

3.
tenths place 5
ten thousands place 7
thousandths place 6
millions place 3
hundredths place 1
hundred thousands place 2
tens place 4
hundreds place 0
thousands place 8
ones place 9

4. a. (given)

b. 40,000

c. 600,000,000,000

d. $\frac{7}{1{,}000}$ or 0.007

5. a. (given)

b. $50 + 8 + \frac{2}{10} + \frac{3}{100}$

$50 + 8 + 0.2 + 0.03$

c. $40 + 1 + \frac{9}{10} + \frac{3}{100} + \frac{6}{1{,}000}$

$40 + 1 + 0.9 + 0.03 + 0.006$

d. $30 + 3 + \frac{6}{10} + \frac{1}{100}$

$30 + 3 + 0.6 + 0.01$

e. $8 + \frac{3}{100} + \frac{8}{1{,}000}$

$8 + 0.03 + 0.008$

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Review

1. a. $12\frac{1}{4} + 3\frac{1}{4} = 15\frac{2}{4} = 15\frac{1}{2}$

b. $9 - 4\frac{3}{4} = 8\frac{4}{4} - 4\frac{3}{4} = 4\frac{1}{4}$

2. a. $3^3 = 3 \times 3 \times 3 = 27$

b. $2^5 = 2 \times 2 \times 2 \times 2 \times 2 = 32$

c. $5^3 = 5 \times 5 \times 5 = 125$

3. 3: 3, 6, 9, 12, 15, 18, 21, 24, 27, 30
5: 5, 10, 15, 20, 25, 30
6: 6, 12, 18, 24, 30

LCM: 30

4. a. $3 \times 3 = 9$
$9 \times 3 = 27$
$27 \times 3 = 81$
$81 \times 3 = 243$

3, 9, 27, 81, 243

b. $8 \times 10 = 80$
$80 \times 10 = 800$
$800 \times 10 = 8{,}000$
$8{,}000 \times 10 = 80{,}000$

8, 80, 800, 8,000, 80,000

5. $F = 9C \div 5 + 32$
$F = 9 \times 15 \div 5 + 32$
$F = 135 \div 5 + 32$
$F = 27 + 32$
$F = 59$

59 °F

6. a. $A = \frac{bh}{2}$

b. area $= \frac{51 \text{ ft} \times 12 \text{ ft}}{2} = \frac{612 \text{ ft}^2}{2} = 306 \text{ ft}^2$

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READING AND WRITING DECIMAL NUMBERS

Video Lesson

Top Box

thirty-five and seven hundredths
twenty and two tenths
forty-two and five hundred forty-nine thousandths

Bottom Box

0.53
0.302
0.9

Practice

1. hundreds tens ones . tenths hundredths thousandths

2.
a. 73.04 (73.4) 7.34 73.004
b. 56.2 5.062 (5.62) 5.602
c. 35,000 (0.35) 35.100 0.35100
d. 90.8 98,000 90.08 (90.008)
e. 18.423 8.423 (80.423) 80,423

3.
a. 49.3
b. 810.72
c. 7.023
d. 16.02
e. 50.009

4.
a. thirty-one and eight tenths
b. eleven and fourteen hundredths
c. two and five hundred sixty-three thousandths
d. one hundred and five thousandths

5.
a. fifty-eight hundredths
b. 0.054
c. 1.4
d. six thousandths
e. three and nine tenths
f. 12.08
g. 203.2
h. one hundred two and three tenths
i. ninety-seven and five hundredths
j. 0.314

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Review

1. a. $8\overline{)1,707}$ = $213\frac{3}{8}$

-16
10
-8
27
-24
3

b. $12\overline{)1,589}$ = $132\frac{5}{12}$

-12
38
-36
29
-24
5

2. 3: 3, 6, 9, 12, 15, 18, 21, 24, 27, (30)
5: 5, 10, 15, 20, 25, (30)
10: 10, 20, (30)

LCM: 30

3. a. $4\frac{1}{3} + 3\frac{2}{3} =$

$7\frac{3}{3} =$

8

b. $12 - \frac{9}{10} =$

$11\frac{10}{10} - \frac{9}{10} =$

$11\frac{1}{10}$

4. a. The triangle should have three acute angles and all sides of the same length.



b. The triangle should have an obtuse angle and three sides of different lengths.



5. a. trapezoid

b. rhombus

c. square

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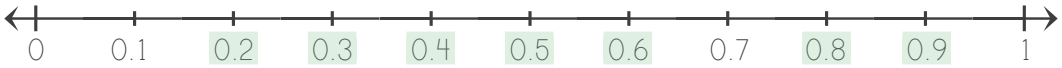
DECIMAL NUMBERS ON A NUMBER LINE

Video Lesson



Practice

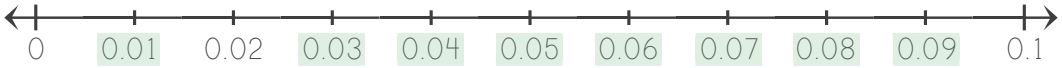
1. a.



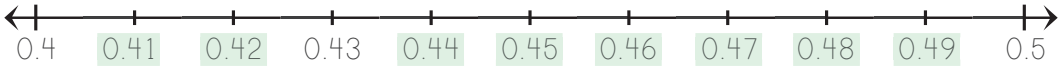
b.



2. a.



b.



3. a.



b.



4. a. Point A: 2.4 Point B: 2.7 Point C: 2.1

b. Point D: 0.52 Point E: 0.58 Point F: 0.56

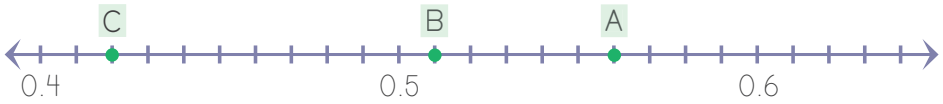
c. Point G: 0.031 Point H: 0.035 Point I: 0.039

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5.



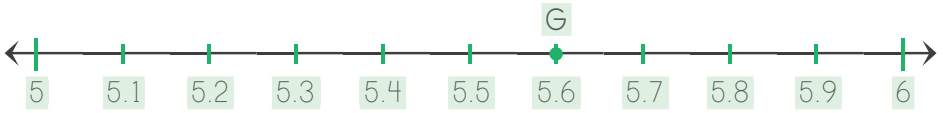
6.



7.



8.



Review

1.

Standard Form	Word Form
114.9	one hundred fourteen and nine tenths
15.29	fifteen and twenty-nine hundredths
4.319	four and three hundred nineteen thousandths

2. $7\overline{)4{,}907}$ = 701

3. $(98 + 2) \div 5^2 - 2 =$
$100 \div 5^2 - 2 =$
$100 \div 25 - 2 =$
$4 - 2 =$
2

4. $5 \times 60 \times 2 =$
$5 \times 2 \times 60 =$
$10 \times 60 =$
600

5. a. $72 \div 6 = A$

$6\overline{)7^{1}2}$ = 12

A = 12

b. $11 \times 11 = 121$
B = 11

6. a. $12^2 = 12 \times 12 = 144$

b. $8^2 = 8 \times 8 = 64$

c. $\sqrt{100} = 10$

d. $\sqrt{49} = 7$

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EQUIVALENT DECIMAL NUMBERS

Video Lesson

Top Box

0.302 0.32 0.3020

Bottom Box

Answers will vary. Example answers:
15.0, 15.00, 15.000

Practice



2. a. 0.9 = 0.90 = 0.900

b. 0.3 = 0.30 = 0.300

3. a. 4.2 = 4.20

b. 2.02 ≠ 2.20

c. 0.080 ≠ 0.8

d. 71.04 ≠ 71.40

4. a. 0.45

b. 5.16

c. 51.6

d. 76.901

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Review

1.



2. $\frac{4}{5}$: Half of 5 is $2\frac{1}{2}$. 4 is greater than $2\frac{1}{2}$, so $\frac{4}{5}$ is greater than $\frac{1}{2}$.

$\frac{1}{4}$: Half of 4 is 2. 1 is less than 2, so $\frac{1}{4}$ is less than $\frac{1}{2}$.

$\frac{1}{4}, \frac{1}{2}, \frac{4}{5}$

3. a. 290×10^5

The exponent is 5. Add 5 zeros after 290.

$290 \times 10^5 =$ 29,000,000

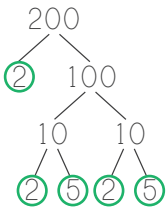
b. $40{,}000 \div 10^3$

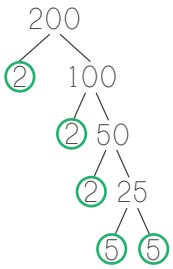
The exponent is 3. Take 3 zeros off of 40,000.

$40{,}000 \div 10^3 =$ 40

4. Students only need to show one way, but two examples are given below.

$2 \times 2 \times 2 \times 5 \times 5$





5. The number is divisible by 2 because it is even.

3 + 6 + 1 + 2 + 0 = 12 12 is divisible by 3, so 36,120 is divisible by 3.

The number formed by the last two digits (20) is divisible by 4, so 36,120 is divisible by 4.

The number is divisible by 5 because it ends in a 0.

The number is divisible by 6 because it is divisible by both 2 and 3.

3 + 6 + 1 + 2 + 0 = 12 12 is not divisible by 9, so 36,120 is not divisible by 9.

The number is divisible by 10 because it ends in a 0.

2 3 4 5 6 ~~9~~ 10

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ADDING AND SUBTRACTING DECIMAL NUMBERS

Video Lesson

Top Box

```
  2
  15.050
  09.108
+ 17.000
  41.158
```

41.158

Bottom Box

```
  1 17
  $22.81
- $01.93
  $20.88
```

$20.88

Practice

1.
```
  1 12
  2 10.429
- 1 3 7.008
  0 9 3.421
```

93.421 m

2.
```
  1   1 1 3
  230.429
  230.429
  230.429
+ 230.429
  921.716
```

921.716 m

3.
```
  2 2  1
  18.900
  18.900
  73.152
+ 73.152
  184.104
```

184.104 m

4.
```
    7
  6,649.809
- 0000.011
  6,649.798
```

6,649.798 km

5.
```
  1 9
  2 10.243
- 1 4.500
  0 5.743
```

5.743 ft

6.
```
  1 1 1
  99.79
+ 99.79
  199.58
```

199.58 kg

7.
```
  1 1 1
  113.562
  113.562
+ 113.562
  340.686
```

340.686 L

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8. a.
$$\begin{array}{r} {\scriptstyle 1\ 1}\\ \$1.39\\ +\ \$0.64\\ \hline \$2.03 \end{array}$$

b.
$$\begin{array}{r} \$0.52\\ +\ \$0.24\\ \hline \$0.76 \end{array}$$

c.
$$\begin{array}{r} {\scriptstyle 1}\\ \$0.72\\ \$0.52\\ +\ \$2.20\\ \hline \$3.44 \end{array}$$

d.
$$\begin{array}{r} {\scriptstyle 1}\\ \$0.24\\ \$1.92\\ +\ \$0.72\\ \hline \$2.88 \end{array}$$

e. Answers will vary.

9.
$$\begin{array}{r} 35.556\\ -\ 10.000\\ \hline 25.556 \end{array}$$

25.556 °C

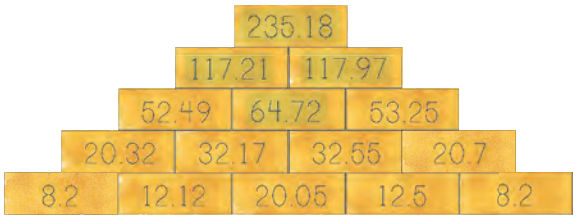
10. To find the number in each block, add the two blocks below it.

32.17 + 32.55
$$\begin{array}{r} {\scriptstyle 1}\\ 32.17\\ +\ 32.55\\ \hline 64.72 \end{array}$$

52.49 + 64.72
$$\begin{array}{r} {\scriptstyle 1\ 1}\\ 52.49\\ +\ 64.72\\ \hline 117.21 \end{array}$$

64.72 + 53.25
$$\begin{array}{r} 64.72\\ +\ 53.25\\ \hline 117.97 \end{array}$$

117.21 + 117.97
$$\begin{array}{r} {\scriptstyle 1\ 1}\\ 117.21\\ +\ 117.97\\ \hline 235.18 \end{array}$$

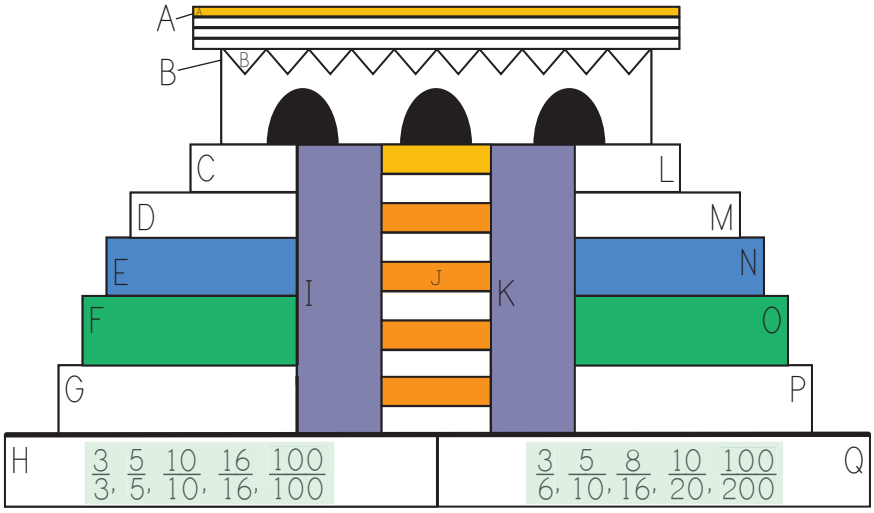


11.
$$\begin{array}{r} {\scriptstyle 2\ 1}\\ 2\not{3}5.18\\ -\ 226.18\\ \hline 9.00 \end{array}$$

9 years

Review

1.–3. Answers will vary. Sample answers are shown below.



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ROUNDING DECIMAL NUMBERS

Video Lesson

Top Box

$10.00



Bottom Box

ones place:
22.5̲09
round up
23

tenths place:
22.50̲9
round down
22.5

hundredths place:
22.50̲9
round up
22.51

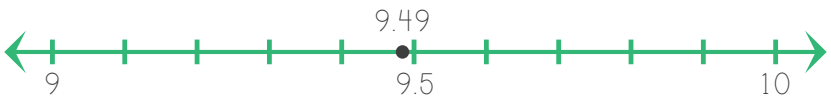
Practice

1. a.



9

b.



9

c.



10

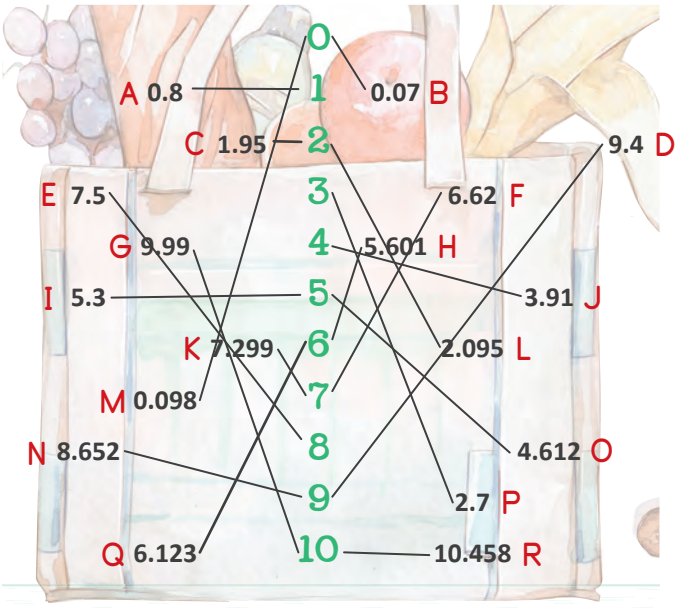
d.



9

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2. Work for each problem is shown below.



A 0.8
rounds up to 1

B 0.07
rounds down to 0

C 1.95
rounds up to 2

D 9.4
rounds down to 9

E 7.5
rounds up to 8

F 6.62
rounds up to 7

G 9.99
rounds up to 10

H 5.601
rounds up to 6

I 5.3
rounds down to 5

J 3.91
rounds up to 4

K 7.299
rounds down to 7

L 2.095
rounds down to 2

M 0.098
rounds down to 0

N 8.652
rounds up to 9

O 4.612
rounds up to 5

P 2.7
rounds up to 3

Q 6.123
rounds down to 6

R 10.458
rounds down to 10

3. a. ones place
3.746
round up
4

tenths place
3.746
round down
3.7

hundredths place
3.746
round up
3.75

b. ones place
12.806
round up
13

tenths place
12.806
round down
12.8

hundredths place
12.806
round up
12.81

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4. a. ones place
0.22
round down
0

58.832
round up
59

b. tenths place
89.52
round down
89.5

7.05
round up
7.1

c. hundredths place
64.832
round down
64.83

5.093
round down
5.09

5. a. rounds to 6 — 6.1 or 6.3
rounds to 4 — 3.6 or 3.9
rounds to 9.3 — 9.31
rounds to 3.7 — 3.69

b. rounds to 3 — 2.54 or 2.58 or 2.84 or 2.85
rounds to 5.5 — 5.48
rounds to 8.43 — 8.425

6. a. $2.76
round up
$3

b. $4.31
round down
$4

c. $14.08
round down
$14

d. $77.50
round up
$78

7. a. 7.92 m
rounds up to 8 m

23.014 m
rounds down to 23 m

8 m + 23 m = 31 m
7.92 m + 23.014 m ≈ 31 m

b. 12.48 ft
rounds down to 12 ft

10.905 ft
rounds up to 11 ft

12 ft × 11 ft = 132 ft^2
12.48 ft × 10.905 ft ≈ 132 ft^2

c. 199.65 yd
rounds up to 200 yd

9.872
rounds up to 10

200 yd ÷ 10 = 20 yd
199.65 yd ÷ 9.872 ≈ 20 yd

d. 849.5 in
rounds up to 850 in

49.926 in
rounds up to 50 in

850 in - 50 in = 800 in
849.5 in - 49.926 in ≈ 800 in

8. a. 5.92
rounds up to 6

6.08
rounds down to 6

5.47
rounds down to 5

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7.001
rounds down to 7

6.4
rounds down to 6

5.503
rounds up to 6

5.92 6.08 5.47 7.001 6.4 5.503

b. 14.19
rounds up to 14.2

14.183
rounds up to 14.2

14.25
rounds up to 14.3

14.208
rounds down to 14.2

14.16
rounds up to 14.2

14.227
rounds down to 14.2

14.19 14.183 14.25 14.208 14.16 14.227

Review

1. 

2. 3.045 03.45 3.4500
03.045 3.450 3.45000

3. a.
$$\begin{array}{r} {\scriptstyle 1} \\ 0.73 \\ +\ 1.80 \\ \hline 2.53 \end{array}$$

b.
$$\begin{array}{r} {\scriptstyle 1} \\ 2.903 \\ +\ 10.420 \\ \hline 13.323 \end{array}$$

c.
$$\begin{array}{r} {\scriptstyle 0\,1} \\ \not{1}5.942 \\ -\ 7.130 \\ \hline 8.812 \end{array}$$

d.
$$\begin{array}{r} {\scriptstyle 7\,1\quad 3\,1} \\ \not{8}\,5.\not{4}21 \\ -\ 8.380 \\ \hline 77.041 \end{array}$$

4. a. square

b. rhombus

c. trapezoid

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COMPARING/ORDERING DECIMAL NUMBERS THROUGH THE TEN THOUSANDTHS PLACE

Video Lesson

Compare the tenths place:
465.135
465.05 ⟵ least
465.1357
465.1381

Compare the thousandths place:
465.135
465.1357
465.1381 ⟵ greatest

Compare the ten-thousandths place:
465.1350
465.1357



Practice

1. Any strategy may be used to compare decimal numbers. The problems below are compared by lining up the decimal places.

a. 5.6209
5.6029
5.6209 > 5.6029

b. 4.6
4.5993
4.6 > 4.5993

c. 0.7302
0.7321
0.7302 < 0.7321

d. 13.0006
13.6005
13.0006 < 13.6005

e. 0.3034
0.3004
0.3034 > 0.3004

2. Any method may be used to compare decimal numbers. The problems below are compared by looking at the decimal part as a whole number.

a. 9.8000 (greatest) 9.5671 (least) 9.6140 (middle)

Least to greatest:
9.5671, 9.614, 9.8

b. 0.9989 (least) 0.9990 (middle) 0.9991 (greatest)

Least to greatest:
0.9989, 0.999, 0.9991

c. 3.3620 (least) 3.3623 (greatest) 3.3622 (middle)

Least to greatest:
3.362, 3.3622, 3.3623

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3. a.

Kierra	Kyle	Sami	Jill
0.2498	0.2497	0.2499	0.2506
second smallest	least	second largest	greatest

Least to greatest:
Kyle, Kierra, Sami, Jill

b.
$$\begin{array}{r} {\scriptstyle 1\ 2\ 3\ 3} \\ 0.2498 \\ 0.2497 \\ 0.2499 \\ +\ 0.2506 \\ \hline 1.0000 \end{array}$$

4. a. 0.9999
0.9876

b. 0.0001
0.0123

5. a.–c. Answers will vary.

6. a.
$$\begin{array}{r} {\scriptstyle 1} \\ 0.109 \\ +\ 0.139 \\ \hline 0.248 \end{array}$$

b.
$$\begin{array}{r} 25.04 \\ -\ 25.01 \\ \hline 00.03 \end{array}$$

c.
$$\begin{array}{r} 12.08 \\ +\ 11.50 \\ \hline 23.58 \end{array}$$

d.
$$\begin{array}{r} 20.0 \\ +\ \ 3.4 \\ \hline 23.4 \end{array}$$

e.
$$\begin{array}{r} {\scriptstyle 1} \\ 52.5 \\ +\ 70.5 \\ \hline 123.0 \end{array}$$

f.
$$\begin{array}{r} {\scriptstyle 1\ 1\ \ 1\ 1} \\ 99.9951 \\ +\ 23.0050 \\ \hline 123.0001 \end{array}$$

g.

		0	0	3			
		0	2	4	8		
	2	3	4				
	2	3	5	8			
1	2	3					
1	2	3	0	0	0	1	

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Review

1. ones place:
54.0852
round down
54

tenths place:
54.0852
round up
54.1

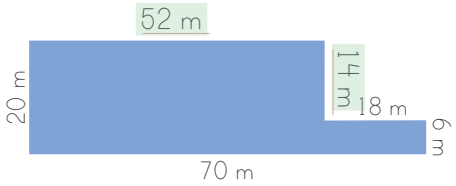
hundredths place:
54.0852
round up
54.09

thousandths place:
54.0852
round down
54.085

2. a. 1, 2, 3, 4, 6, 8, 12, 24

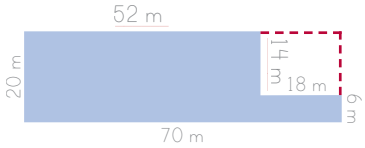
b. 1, 2, 3, 6, 7, 14, 21, 42

3. Length of top side: 70 m - 18 m = 52 m
Length of right side: 20 m - 6 m = 14 m



perimeter = 20 m + 52 m + 14 m + 18 m + 6 m + 70 m = 180 m

The area may be calculated in different ways. The work below is based on the figure being split as shown.



Area of large rectangle:
70 m × 20 m = 1,400 m^2

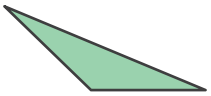
Area of the empty space:
18 m × 14 m = 252 m^2

Area of the figure:
1,400 m^2 - 252 m^2 = 1,148 m^2

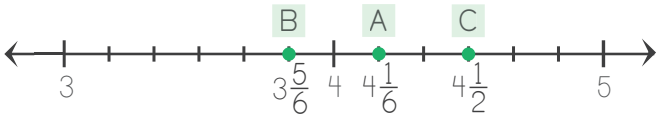
4. a. The triangle should have a right angle and two sides of the same length.



b. The triangle should have an obtuse angle and three sides of different lengths.



5.



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REDUCING FRACTIONS

Video Lesson

$\frac{3}{9}$ $\quad$ $\frac{5}{7}$ $\quad$ $\frac{8}{20}$

$\frac{3}{9} \div 3 = \frac{1}{3}$

$\frac{8}{20} \div 4 = \frac{2}{5}$

Practice

1.

a. $\frac{5}{10} \div 5 = \frac{1}{2}$

b. $\frac{15}{24} \div 3 = \frac{5}{8}$

c. $\frac{3}{9} \div 3 = \frac{1}{3}$

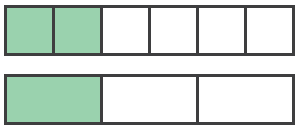
d. $\frac{21}{35} \div 7 = \frac{3}{5}$

e. $\frac{8}{10} \div 2 = \frac{4}{5}$

f. $\frac{33}{44} \div 11 = \frac{3}{4}$

2.

a. (given)

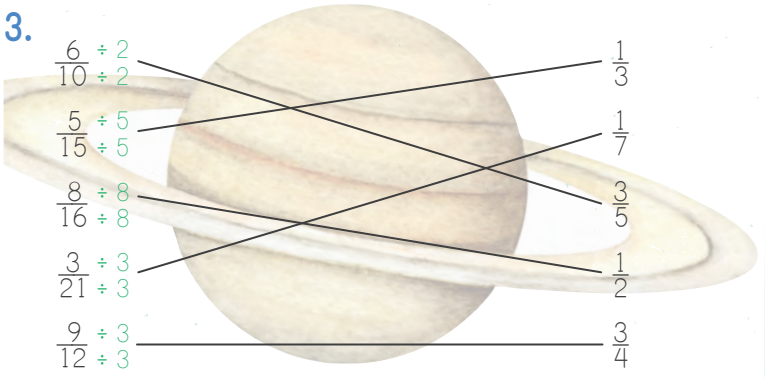
b.  $\frac{2}{6}$

 $\frac{1}{3}$

c.  $\frac{6}{8}$

 $\frac{3}{4}$

3.



4.

a. $\frac{2}{4} \div 2 = \frac{1}{2}$

b. $\frac{3}{12} \div 3 = \frac{1}{4}$

c. $\frac{3}{9} \div 3 = \frac{1}{3}$

d. $\frac{3}{15} \div 3 = \frac{1}{5}$

e. $\frac{35}{40} \div 5 = \frac{7}{8}$

f. $\frac{5}{30} \div 5 = \frac{1}{6}$

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5. a. $\frac{10}{20} \div 2 = \frac{5}{10}$

$\frac{10}{20} \div 5 = \frac{2}{4}$

$\frac{10}{20} \div 10 = \frac{1}{2}$

$\frac{2}{10}$ $\frac{5}{10}$ $\frac{1}{2}$ $\frac{2}{4}$

b. $\frac{12}{36} \div 3 = \frac{4}{12}$

$\frac{12}{36} \div 4 = \frac{3}{9}$

$\frac{12}{36} \div 6 = \frac{2}{6}$

$\frac{12}{36} \div 12 = \frac{1}{3}$

$\frac{4}{12}$ $\frac{3}{9}$ $\frac{2}{6}$ $\frac{1}{3}$

c. $\frac{9}{45} \div 3 = \frac{3}{15}$

$\frac{9}{45} \div 9 = \frac{1}{5}$

$\frac{1}{5}$ $\frac{6}{9}$ $\frac{3}{15}$ $\frac{2}{9}$

d. $\frac{20}{50} \div 2 = \frac{10}{25}$

$\frac{20}{50} \div 5 = \frac{4}{10}$

$\frac{20}{50} \div 10 = \frac{2}{5}$

$\frac{10}{30}$ $\frac{2}{5}$ $\frac{4}{10}$ $\frac{10}{25}$

6. 3 and 8 do not have any common factors other than 1.
4 and 5 do not have any common factors other than 1.
9 and 10 do not have any common factors other than 1.

~~$\frac{3}{8}$~~ ~~$\frac{4}{5}$~~ $\frac{9}{15}$ $\frac{4}{12}$ $\frac{10}{15}$ ~~$\frac{9}{10}$~~

7. a. $\frac{2}{8} + \frac{2}{8} = \frac{4 \div 4}{8 \div 4} = \frac{1}{2}$

b. $\frac{3}{12} + \frac{2}{12} + \frac{4}{12} = \frac{9 \div 3}{12 \div 3} = \frac{3}{4}$

c. $\frac{3}{6} + \frac{1}{6} = \frac{4 \div 2}{6 \div 2} = \frac{2}{3}$

d. $\frac{9}{20} + \frac{6}{20} = \frac{15 \div 5}{20 \div 5} = \frac{3}{4}$

8. a. $\frac{6}{12}$ (snorkel) $\frac{13}{15}$ (self) $\frac{4}{16}$ (sea)

b. $\frac{9}{10}$ (contained) $\frac{2}{8}$ (carrying) $\frac{18}{20}$ (converted)

c. $\frac{20}{100}$ (underneath) $\frac{17}{20}$ (underwater) $\frac{16}{32}$ (until)

d. $\frac{22}{40}$ (buoyant) $\frac{33}{60}$ (before) $\frac{11}{20}$ (breathing)

e. $\frac{3}{9}$ (article) $\frac{5}{21}$ (apparatus) $\frac{15}{30}$ (agent)

self-contained underwater breathing apparatus

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Review

1. a. 18.05
18.5

18.05 < 18.5

b. 14.9301
14.8931

14.9301 > 14.8931

c. 876 = 876.00

d. 06.30
60.003

6.30 < 60.003

2. a. $\sqrt{100} = 10$

b. $\sqrt{49} = 7$

c. $\sqrt{169} = 13$

d. $\sqrt{36} = 6$

3. a.
$$12\overline{)3,624}\quad 302$$

b.
$$7\overline{)6,030}\quad 861\frac{3}{7}$$
$$-56$$
$$43$$
$$-42$$
$$10$$
$$-7$$
$$3$$

4. a. 12.42

b. 5,302.405

5. a. $1 - \frac{2}{3} = \frac{3}{3} - \frac{2}{3} = \frac{1}{3}$

b. $1 - \frac{1}{6} = \frac{6}{6} - \frac{1}{6} = \frac{5}{6}$

6. a. $2\frac{1}{4} + 3\frac{2}{4} =$
$5 + \frac{3}{4} =$
$5\frac{3}{4}$

b. $9 - 1\frac{5}{7} =$
$8\frac{7}{7} - 1\frac{5}{7} =$
$7\frac{2}{7}$

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CONVERTING DECIMALS AND PERCENTS TO FRACTIONS

Video Lesson

Top Box

$4.809 = 4\frac{809}{1{,}000}$

Bottom Box

$95\% = \frac{95}{100} = \frac{19}{20}$

Practice

1. a. (given)

b. 19% is 19 parts out of 100

$19\% = \frac{19}{100}$

c. 23% is 23 parts out of 100

$23\% = \frac{23}{100}$

d. 41% is 41 parts out of 100

$41\% = \frac{41}{100}$

2. a. (given)

b. $0.8 = \frac{8}{10} = \frac{4}{5}$

c. $0.25 = \frac{25}{100} = \frac{1}{4}$

d. $0.2 = \frac{2}{10} = \frac{1}{5}$

e. $0.16 = \frac{16}{100} = \frac{4}{25}$

f. $0.95 = \frac{95}{100} = \frac{19}{20}$

3. a. $0.3 = \frac{3}{10}$

b. $28.009 \neq 28\frac{9}{100}$

$(28\frac{9}{1{,}000})$

c. $0.591 \neq \frac{591}{10{,}000}$

$(\frac{591}{1{,}000})$

d. $0.853 = \frac{853}{1{,}000}$

e. $6.17 = 6\frac{17}{100}$

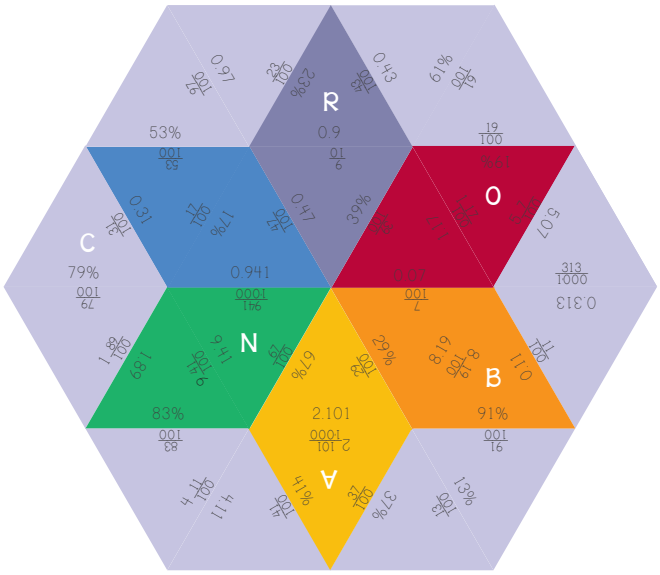
f. $12.907 \neq 12\frac{97}{100}$

$(12\frac{907}{1{,}000})$

4. a. $10.2 = 10\frac{2}{10} = 10\frac{1}{5}$

b. $24.45 = 24\frac{45}{100} = 24\frac{9}{20}$

5. CARBON



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Review

1. two billion, three hundred twelve and five tenths

2. $F = 9C \div 5 + 32$
$F = 9 \times 30 \div 5 + 32$
$F = 270 \div 5 + 32$
$F = 54 + 32$
$F = 86$

30 °C = 86 °F

3. a. 165,298,003,452.017

b. 29,234,673,820.8192

c. 185,604,389,702.6219

4. $10 \times 10 = 100$

 = 10

 = 10, so  + 10 +  = 32.

This means  +  = 22.

Guess and check.

Try  = 1.

If  = 1, then  = 10.

$1 + 11 \neq 22$

Try  = 2.

If  = 2, then  = 20.

$2 + 20 = 22$.

 = 2  = 20

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PROBABILITY

Video Lesson

Top of Box

Probability of drawing an owl card:

$\frac{\text{number of desired outcomes}}{\text{number of possible outcomes}} \quad \frac{2}{10}$

Bottom of Box

$\frac{2}{10} + \frac{2}{10} + \frac{3}{10} + \frac{3}{10} = \frac{10}{10} = 1$

owl deer fox raccoon

Practice

1. a. heads: $\frac{1}{2}$

tails: $\frac{1}{2}$

b. $\frac{1}{2} + \frac{1}{2} = \frac{2}{2} = 1$

c. 100%

2. a. $\frac{1}{6}$

b. $\frac{1}{6}$

c. $\frac{3}{6} = \frac{1}{2}$

d. $\frac{2}{6} = \frac{1}{3}$

3. a. 100% - 20% = 80%

b. 20% + 40% = 60%

c. 100% - 60% = 40%

4. a. (given)

b. $\frac{1}{8}$

c. $\frac{2}{8} = \frac{1}{4}$

d. $\frac{5}{8}$

5. a. 10 + 16 + 14 = 40

$\frac{14}{40} = \frac{7}{20}$

b. $\frac{0}{40} = 0$

c. $\frac{10}{40} = \frac{1}{4}$

d. $\frac{40}{40} - \frac{10}{40} = \frac{30}{40} = \frac{3}{4}$

6. (1)

a. $\frac{1}{2}$

b. $\frac{1}{2}$

c.–e. Answers will vary.

(2)

a. 1? $\frac{1}{6}$ 2? $\frac{1}{6}$ 3? $\frac{1}{6}$

4? $\frac{1}{6}$ 5? $\frac{1}{6}$ 6? $\frac{1}{6}$

b. $\frac{1}{6} + \frac{1}{6} + \frac{1}{6} + \frac{1}{6} + \frac{1}{6} + \frac{1}{6} = \frac{6}{6} = 1$

c.–g. Answers will vary.

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Review

1. a. (given)

b. $\frac{9}{36} = \frac{3}{12} = \frac{1}{4}$

c. $\frac{25}{50} = \frac{5}{10} = \frac{1}{2}$

d. $\frac{8}{24} = \frac{4}{12} = \frac{1}{3}$

2. a. $10\% = \frac{10}{100} = \frac{1}{10}$

b. $80\% = \frac{80}{100} = \frac{4}{5}$

c. $0.3 = \frac{3}{10}$

d. $20.05 = 20\frac{5}{100} = 20\frac{1}{20}$

3. a. The congruent triangle should have the same size and shape as the original triangle, but it may be flipped.



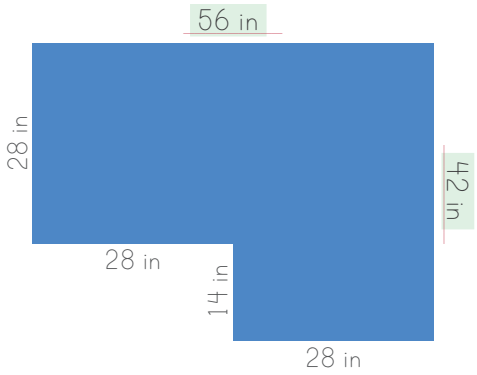
b. The similar triangle can be larger or smaller and flipped, but it should have the same shape.



4. -7, -5, -1, 0, 2, 3

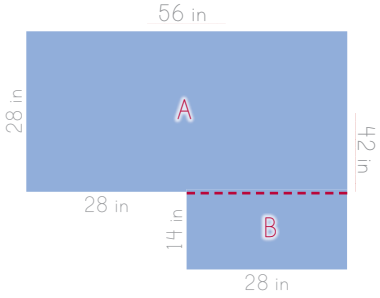
5. Length of the top side:
28 in + 28 in = 56 in

Length of the right side:
28 in + 14 in = 42 in



perimeter = 56 in + 42 in + 28 in + 14 in + 28 in + 28 in = 196 in

The area may be calculated in different ways. The work below is based on the figure being split as shown.



Area A: 56 in × 28 in = 1,568 in^2
Area B: 28 in × 14 in = 392 in^2
Area of irregular shape: 1,568 in^2 + 392 in^2 = 1,960 in^2

6. a. $\frac{3}{3}$

b. $\frac{7}{14}$

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MULTIPLYING FRACTIONS BY FRACTIONS

Video Lesson

$\frac{2}{3} \times \frac{4}{5} = \frac{8}{15}$

Practice

1. a.



$\frac{1}{3} \times \frac{1}{2} = \frac{1}{6}$

b.



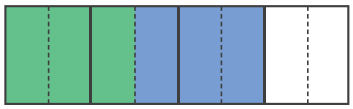
$\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$

c.



$\frac{2}{3} \times \frac{1}{3} = \frac{2}{9}$

d.



$\frac{1}{2} \times \frac{3}{4} = \frac{3}{8}$

2. a. $\frac{1}{3} \times \frac{3}{8} = \frac{3}{24} = \frac{1}{8}$

b. $\frac{4}{7} \times \frac{5}{10} = \frac{20}{70} = \frac{2}{7}$

c. $\frac{3}{6} \times \frac{2}{6} = \frac{6}{36} = \frac{1}{6}$

d. $\frac{3}{5} \times \frac{1}{2} = \frac{3}{10}$

e. $\frac{8}{12} \times \frac{2}{4} = \frac{16}{48} = \frac{1}{3}$

3. a.



$\frac{1}{2} \times \frac{1}{2} = \frac{1}{4}$

$\frac{1}{4}$ of the children are boys with brown eyes

b.



$\frac{1}{2} \times \frac{2}{3} = \frac{2}{6} = \frac{1}{3}$

$\frac{1}{3}$ of the children saw a waterfall

c.



$\frac{1}{4} \times \frac{1}{3} = \frac{1}{12}$

$\frac{1}{12}$ cup of honey

4. $A = L \times W$

a. $\frac{7}{8}$ mi $\times \frac{1}{3}$ mi $= \frac{7}{24}$ mi^2

b. $\frac{10}{12}$ m $\times \frac{2}{5}$ m $= \frac{20}{60}$ m^2 $= \frac{1}{3}$ m^2

c. $\frac{1}{8}$ km $\times \frac{8}{10}$ km $= \frac{8}{80}$ km^2 $= \frac{1}{10}$ km^2

5. a. $\frac{1}{4} + \frac{1}{4} = \frac{2}{4} = \frac{1}{2}$

$\frac{1}{4} \times \frac{1}{4} = \frac{1}{16}$

$\frac{1}{4} + \frac{1}{4} > \frac{1}{4} \times \frac{1}{4}$

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b. $\frac{5}{6} \times \frac{1}{5} = \frac{5}{30} = \frac{1}{6}$

$\frac{1}{5} \times \frac{5}{6} = \frac{5}{30} = \frac{1}{6}$

$\frac{5}{6} \times \frac{1}{5} = \frac{1}{5} \times \frac{5}{6}$

c. $1 - \frac{3}{4} = \frac{4}{4} - \frac{3}{4} = \frac{1}{4}$

$\frac{2}{2} \times \frac{1}{2} = \frac{2}{4} = \frac{1}{2}$

$1 - \frac{3}{4} < \frac{2}{2} \times \frac{1}{2}$

d. $\frac{2}{3} \times \frac{1}{3} = \frac{2}{9}$

$\frac{8}{10} - \frac{3}{10} = \frac{5}{10} = \frac{1}{2}$

$\frac{2}{3} \times \frac{1}{3} < \frac{8}{10} - \frac{3}{10}$

e. $\frac{3}{8} \times \frac{2}{3} = \frac{6}{24} = \frac{1}{4}$

$\frac{1}{2} \times \frac{1}{2} = \frac{1}{4}$

$\frac{3}{8} \times \frac{2}{3} = \frac{1}{2} \times \frac{1}{2}$

Review

1. a. $\frac{3}{6} = \frac{1}{2}$

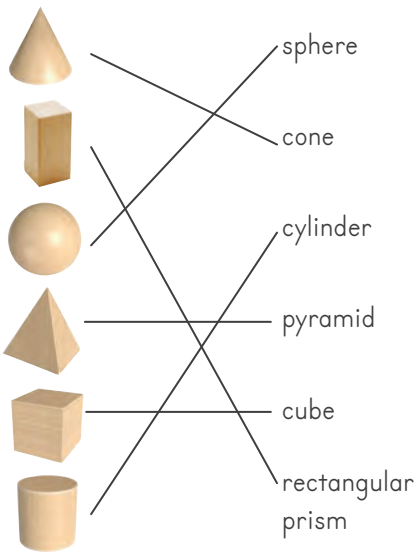
b. 50%

2. a. $25\% = \frac{25}{100} = \frac{1}{4}$

b. $41\% = \frac{41}{100}$

c. $32\% = \frac{32}{100} = \frac{8}{25}$

3.



4. Compare the hundredths place:
27.1068
27.168 ⟵ greatest
27.1069
27.10681

Compare the ten-thousandths place:
27.1068
27.1069 ⟵ second greatest
27.10681

Compare the hundred-thousandths place:
27.10680 ⟵ least
27.10681

Least to greatest:
27.1068, 27.10681, 27.1069, 27.168

5. a. 19 rounds to ⟶ 20
803 rounds to ⟶ 800
20 × 800 = 16,000

19 × 803 ≈ 16,000

b. 203 rounds to ⟶ 200
22 rounds to ⟶ 20

$$20\overline{)200} \quad 10$$

203 ÷ 22 ≈ 10

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EQUIVALENT FRACTIONS

Video Lesson

Top Left Box

$\frac{6}{7} \times \frac{4}{4} = \frac{24}{28}$

Top Middle Box

$\frac{5}{8} = \frac{20}{32}$ (×4 / ×4)

Top Right Box

$\frac{2}{11} = \frac{10}{55}$ (×5 / ×5)

Bottom Box

$\frac{18}{27} \div 9 \div 9 = \frac{2}{3}$

$\frac{8}{24} \div 8 \div 8 = \frac{1}{3}$

$\frac{6}{9} \div 3 \div 3 = \frac{2}{3}$

$\frac{24}{36} \div 12 \div 12 = \frac{2}{3}$

$\frac{2}{3}$ $\frac{18}{27}$ $\boxed{\frac{8}{24}}$ $\frac{6}{9}$ $\frac{24}{36}$

Practice

1. a. $\frac{1}{3} \times \frac{4}{4} = \frac{4}{12}$

   b. $\frac{9}{10} \times \frac{7}{7} = \frac{63}{70}$

   c. $\frac{3}{4} \times \frac{5}{5} = \frac{15}{20}$

   d. $\frac{8}{9} \times \frac{10}{10} = \frac{80}{90}$

   e. $\frac{1}{4} \times \frac{100}{100} = \frac{100}{400}$

   f. $\frac{4}{15} \times \frac{3}{3} = \frac{12}{45}$

2. a. $\frac{1}{2} = \frac{5}{10}$ (×5 / ×5)

   b. $\frac{2}{3} = \frac{4}{6}$ (×2 / ×2)

   c. $\frac{2}{5} = \frac{6}{15}$ (×3 / ×3)

   d. $\frac{5}{6} = \frac{20}{24}$ (×4 / ×4)

   e. $\frac{8}{12} = \frac{16}{24}$ (×2 / ×2)

   f. $\frac{7}{9} = \frac{21}{27}$ (×3 / ×3)

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g. $\frac{4}{5} = \frac{36}{45}$ (×9)

h. $\frac{3}{8} = \frac{24}{64}$ (×8)

3. a. $\frac{8}{12} \div 4 = \frac{2}{3}$

$\frac{10}{15} \div 5 = \frac{2}{3}$

$\frac{4}{6} \div 2 = \frac{2}{3}$

$\frac{8}{36} \div 4 = \frac{2}{9}$

$\frac{8}{12}$ $\frac{10}{15}$ $\frac{4}{6}$ ~~$\frac{8}{36}$~~

b. $\frac{22}{99} \div 11 = \frac{2}{9}$

8 and 27 do not have common factors. $\frac{8}{27}$ is in simplest form.

$\frac{18}{81} \div 9 = \frac{2}{9}$

$\frac{12}{54} \div 6 = \frac{2}{9}$

$\frac{22}{99}$ ~~$\frac{8}{27}$~~ $\frac{18}{81}$ $\frac{12}{54}$

c. $\frac{27}{72} \div 9 = \frac{3}{8}$

$\frac{24}{64} \div 8 = \frac{3}{8}$

$\frac{33}{88} \div 11 = \frac{3}{8}$

21 and 64 do not have common factors. $\frac{21}{64}$ is in simplest form.

$\frac{27}{72}$ $\frac{24}{64}$ $\frac{33}{88}$ ~~$\frac{21}{64}$~~

4. a. $\frac{1}{4} = \frac{2}{8} = \frac{6}{24} = \frac{12}{48}$ (×2, ×3, ×2)

b. $\frac{1}{3} = \frac{3}{9} = \frac{6}{18} = \frac{18}{54}$ (×3, ×2, ×3)

c. $\frac{1}{2} = \frac{4}{8} = \frac{8}{16} = \frac{24}{48}$ (×4, ×2, ×3)

5. Answers will vary. Possible answers are below. Parts a, b, and c are the same, so any answer may be used for any part.

a. $\frac{1}{4} = \frac{2}{8} = \frac{9}{36}$

b. $\frac{2}{4} = \frac{3}{6} = \frac{9}{18}$

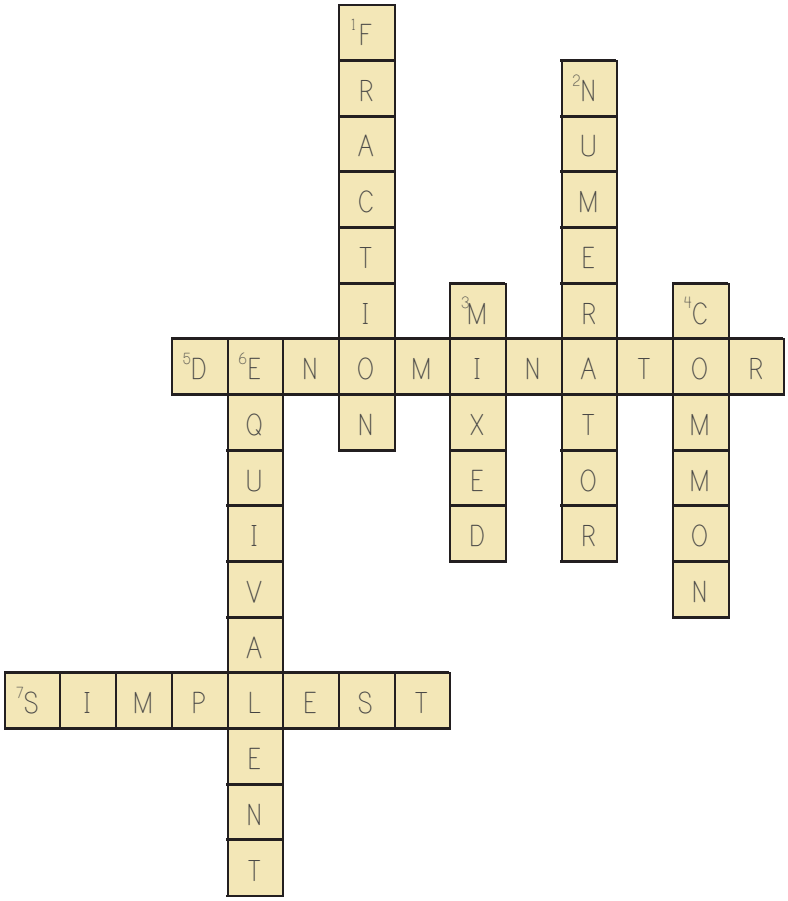
c. $\frac{3}{4} = \frac{6}{8} = \frac{9}{12}$

6. a. $\frac{6}{9} = \frac{?}{45}$ $\frac{6}{9} = \frac{30}{45}$ (×5)

b. $\frac{1}{2} = \frac{32}{?}$ $\frac{1}{2} = \frac{32}{64}$ (×32)

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Fraction Vocabulary



Review

1. a. $8 - 5\frac{5}{6} =$

$7\frac{6}{6} - 5\frac{5}{6} =$

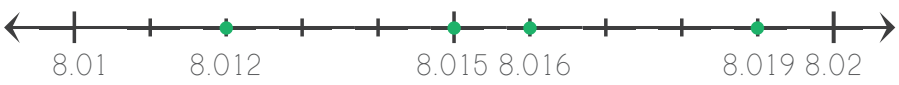
$2\frac{1}{6}$

b. $\frac{3}{12} + \frac{4}{12} + \frac{5}{12} = \frac{12}{12} = 1$

2. a. $\frac{2}{5} \times \frac{1}{4} = \frac{2}{20} = \frac{1}{10}$

b. $\frac{2}{9} \times \frac{11}{12} = \frac{22}{108} = \frac{11}{54}$

3. 8.012 8.016 8.019 8.015

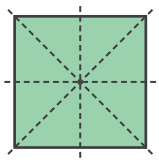


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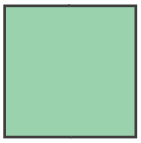
4. a. $8\overline{)2,443}$ $305\frac{3}{8}$

b. $7\overline{)1,7^{3}6^{1}0}$ $251\frac{3}{7}$

5. a.–b.



c.



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UNIT 2 REVIEW: COUNTY FAIR FUN

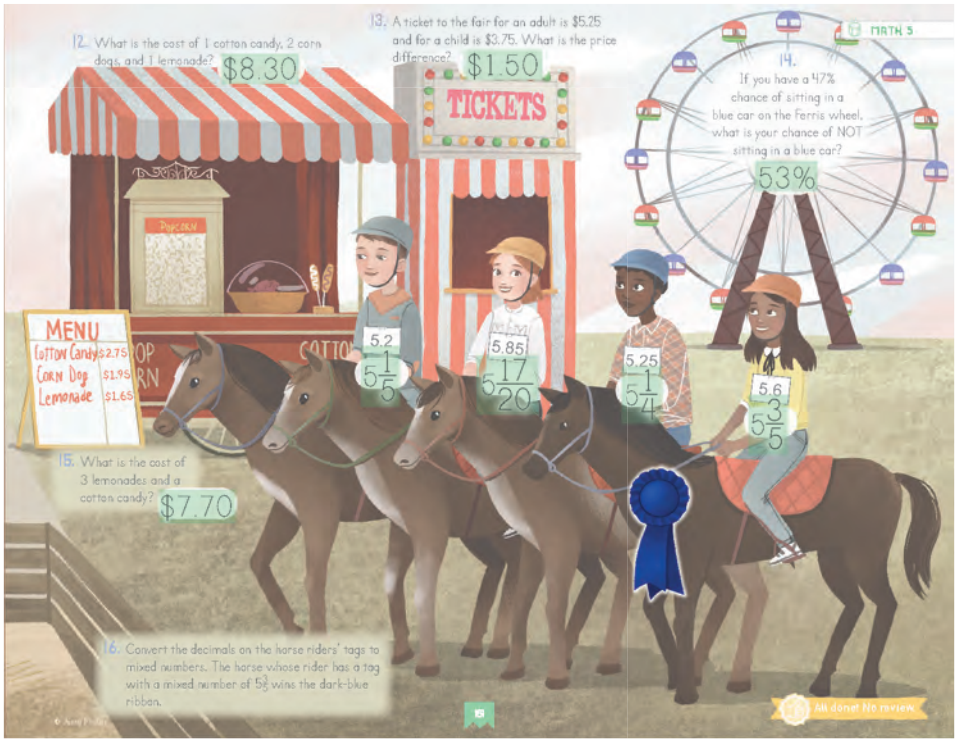
Review

The final answers and the winning ribbons are shown below. Work for each problem is shown starting on the next page.





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1. a. $\frac{1}{8}$: Half of 8 is 4. 1 is less than 4, so $\frac{1}{8}$ is less than $\frac{1}{2}$.

$\frac{2}{4}$: Half of 4 is 2, so $\frac{2}{4}$ is equal to $\frac{1}{2}$.

$\frac{4}{5}$: Half of 5 is $2\frac{1}{2}$. 4 is greater than $2\frac{1}{2}$, so $\frac{4}{5}$ is greater than $\frac{1}{2}$.

Least to greatest: $\frac{1}{8}, \frac{2}{4}, \frac{4}{5}$

b. $\frac{1}{2}$: $\frac{1}{2}$ is equivalent to $\frac{1}{2}$.

$\frac{2}{7}$: Half of 7 is $3\frac{1}{2}$. 2 is less than $3\frac{1}{2}$, so $\frac{2}{7}$ is less than $\frac{1}{2}$.

$\frac{7}{9}$: Half of 9 is $4\frac{1}{2}$. 7 is greater than $4\frac{1}{2}$, so $\frac{7}{9}$ is greater than $\frac{1}{2}$.

Least to greatest: $\frac{2}{7}, \frac{1}{2}, \frac{7}{9}$

c. $\frac{3}{6}$: Half of 6 is 3, so $\frac{3}{6}$ is equal to $\frac{1}{2}$.

$\frac{9}{10}$: Half of 10 is 5. 9 is greater than 5, so $\frac{9}{10}$ is greater than $\frac{1}{2}$.

$\frac{2}{5}$: Half of 5 is $2\frac{1}{2}$. 2 is less than $2\frac{1}{2}$, so $\frac{2}{5}$ is less than $\frac{1}{2}$.

Least to greatest: $\frac{2}{5}, \frac{3}{6}, \frac{9}{10}$

d. $\frac{6}{7}$: Half of 7 is $3\frac{1}{2}$. 6 is greater than $3\frac{1}{2}$, so $\frac{6}{7}$ is greater than $\frac{1}{2}$.

$\frac{8}{16}$: Half of 16 is 8, so $\frac{8}{16}$ is equal to $\frac{1}{2}$.

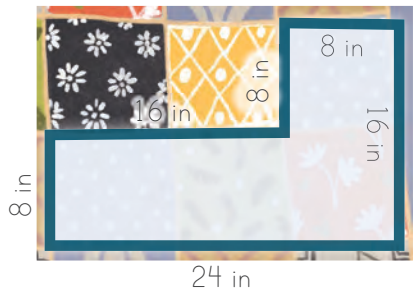
$\frac{5}{5}$: $\frac{5}{5}$ is equal to 1. 1 is equal to $\frac{7}{7}$, and $\frac{7}{7} > \frac{6}{7}$, so $\frac{5}{5}$ is greater than $\frac{6}{7}$.

Least to greatest: $\frac{8}{16}, \frac{6}{7}, \frac{5}{5}$

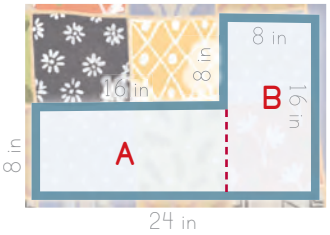
$\frac{5}{5}$ is the greatest fraction.

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2. a. Each square is 8 in by 8 in.

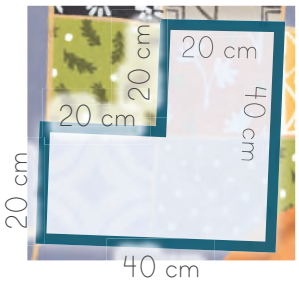


Perimeter = 8 in + 16 in + 24 in + 8 in + 16 in + 8 in = 80 in

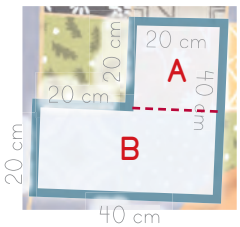


Area A: 16 in × 8 in = 128 in^2
Area B: 8 in × 16 in = 128 in^2
Area of irregular shape: 128 in^2 + 128 in^2 = 256 in^2

b. Each square is 20 cm by 20 cm.



Perimeter = 20 cm + 40 cm + 40 cm + 20 cm + 20 cm + 20 cm = 160 cm



Area A: 20 cm × 20 cm = 400 cm^2
Area B: 40 cm × 20 cm = 800 cm^2
Area of irregular shape: 400 cm^2 + 800 cm^2 = 1,200 cm^2

3. Compare the tenths place:
623.7
623.07 ⟵ least
623.701
623.77

Compare the hundredths place:
623.70
623.701
623.77 ⟵ greatest

Compare the thousandths place:
623.700
623.701

Least to greatest:
623.07, 623.7, 623.701, 623.77

4. a. $294 \times 10^3 = 294{,}000$
294,000 mg = 294 g

b. $261{,}000 \div 10^3 = 261$
261 g = 261,000 mg

c. $283 \times 10^3 = 283{,}000$
283 g = 283,000 mg

294 g (294,000 mg) is the greatest weight.

5. a. tenths place:
42.451 lb
round up
42.5 lb

b. ones place:
39.83 lb
round up
40 lb

c. hundredths place:
36.742 lb
round down
36.74 lb

d. thousandths place:
38.2365 lb
round up
38.237 lb

42.451 lb is the heaviest pumpkin.

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6. a. $\frac{2}{3} \times \frac{4}{9} = \frac{8}{27}$

b. $\frac{7}{8} \times \frac{2}{7} = \frac{14}{56} = \frac{1}{4}$

c. $\frac{5}{6} \times \frac{2}{5} = \frac{10}{30} = \frac{1}{3}$

d. $\frac{6}{7} \times \frac{3}{8} = \frac{18}{56} = \frac{9}{28}$

7. a. $\frac{8}{10} \begin{matrix} \div 2 \\ \div 2 \end{matrix} = \frac{4}{5}$

b. $\frac{20}{100} \begin{matrix} \div 20 \\ \div 20 \end{matrix} = \frac{1}{5}$

c. $\frac{12}{24} \begin{matrix} \div 12 \\ \div 12 \end{matrix} = \frac{1}{2}$

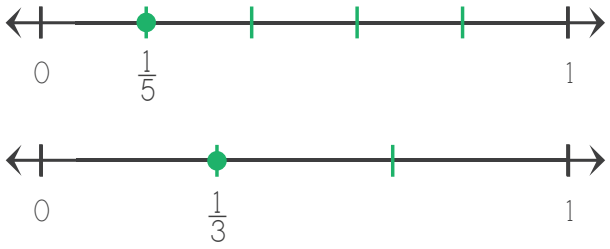
d. $\frac{11}{33} \begin{matrix} \div 11 \\ \div 11 \end{matrix} = \frac{1}{3}$

$\frac{4}{5}$: Half of 5 is $2\frac{1}{2}$. 4 is greater than $2\frac{1}{2}$, so $\frac{4}{5}$ is greater than $\frac{1}{2}$.

$\frac{1}{5}$: Half of 5 is $2\frac{1}{2}$. 1 is less than $2\frac{1}{2}$, so $\frac{1}{5}$ is less than $\frac{1}{2}$.

$\frac{1}{2}$: $\frac{1}{2}$ is equivalent to $\frac{1}{2}$.

$\frac{1}{3}$: Half of 3 is $1\frac{1}{2}$. 1 is less than $1\frac{1}{2}$, so $\frac{1}{3}$ is less than $\frac{1}{2}$.



$\frac{1}{5}$ is the smallest fraction.

8. a.
$$\begin{array}{r} {}^{3}1\cancel{4}{}^{1}2.\cancel{9}{}^{8}04 \\ -\ 38.310 \\ \hline 104.594 \end{array}$$

b.
$$\begin{array}{r} {}^{1} \\ 15.820 \\ +\ 89.067 \\ \hline 104.887 \end{array}$$

c.
$$\begin{array}{r} {}^{1\,1\,1\,1\,1} \\ 99.5259 \\ +\ 4.8942 \\ \hline 104.4201 \end{array}$$

104.887 is the greatest decimal number.

9. a. 100 kg

b. 130 kg

130 kg is the greater weight.

10. a.
$$\begin{array}{r} 9\frac{7}{8} \\ 8\overline{)79} \\ \underline{-72} \\ 7 \end{array}$$

b.
$$\begin{array}{r} 9\frac{1}{7} \\ 7\overline{)64} \\ \underline{-63} \\ 1 \end{array}$$

Half of 8 is 4. 7 is greater than 4, so $\frac{7}{8}$ is greater than $\frac{1}{2}$.

Half of 7 is $3\frac{1}{2}$. 1 is less than $3\frac{1}{2}$, so $\frac{1}{7}$ is less than $\frac{1}{2}$.

$9\frac{7}{8}$ is the greater quotient.

11. 00014.2 = 14.2
14.20 = 14.2
14.200 = 14.2
014.2 = 14.2
14.02 ⟵ This is the only one not equivalent to 14.2.

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12.
$$\begin{array}{r} {\scriptstyle 3\ 2} \\ \$2.75 \\ \$1.95 \\ \$1.95 \\ +\ \$1.65 \\ \hline \$8.30 \end{array}$$

13.
$$\begin{array}{r} {\scriptstyle 4\ 1} \\ \$\not{5}.{\scriptstyle 1}25 \\ -\ \$3.75 \\ \hline \$1.50 \end{array}$$

14. 100% - 47% = 53%

15.
$$\begin{array}{r} {\scriptstyle 2\ 2} \\ \$1.65 \\ \$1.65 \\ \$1.65 \\ +\ \$2.75 \\ \hline \$7.70 \end{array}$$

16. $5.2 = 5\frac{2}{10} = 5\frac{1}{5}$

$5.85 = 5\frac{85}{100} = 5\frac{17}{20}$

$5.25 = 5\frac{25}{100} = 5\frac{1}{4}$

$5.6 = 5\frac{6}{10} = 5\frac{3}{5}$

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UNIT ASSESSMENT

Reading Scales & Using a Ruler

1. $2\frac{3}{10}$ cm

2. 130 dB

Reading Scales & Using a Ruler Additional Practice

1. $1\frac{6}{8}$ in or $1\frac{3}{4}$ in

2. $3\frac{1}{2}$ kg

Converting Units of Weight

1. $2 \times 10^3 = 2{,}000$
   2 kg = 2,000 g

2. 1 lb = 16 oz
   $2 \times 16 = 32$
   2 lb = 32 oz

3. 1 tn = 2,000 lb
   $3 \times 2{,}000 = 6{,}000$
   3 tn = 6,000 lb

4. $4{,}000 \div 10^3 = 4$
   4,000 mg = 4 g

Converting Units of Weight Additional Practice

1. $5 \times 10^3 = 5{,}000$
   5 g = 5,000 mg

2. $7{,}000 \div 10^3 = 7$
   7,000 g = 7 kg

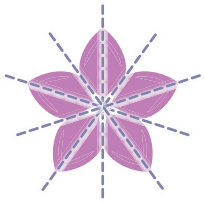
3. 1 lb = 16 oz
   $16 \div 16 = 1$
   16 oz = 1 lb

4. 1 tn = 2,000 lb
   $4{,}000 \div 2{,}000 = 2$
   4,000 lb = 2 tn

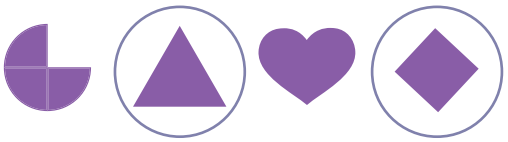
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Symmetry & Transformations

1.

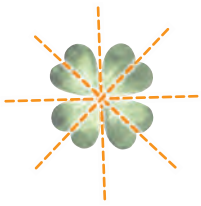


2.



Symmetry & Transformations Additional Practice

1.

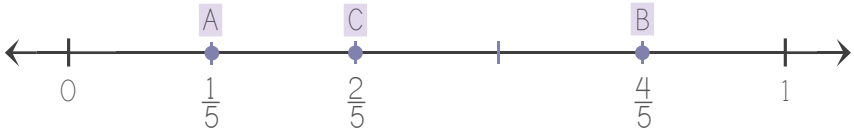


2.

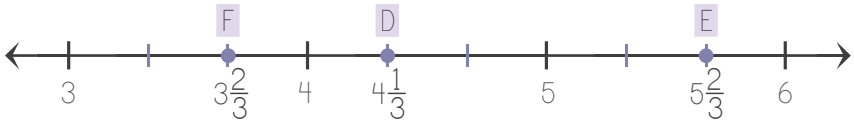


Number Lines with Fractions & Mixed Numbers

1.

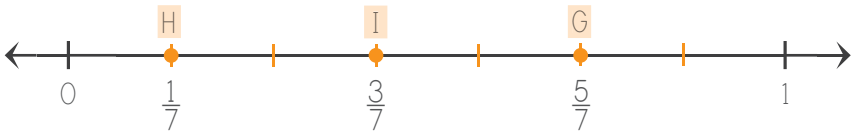


2.

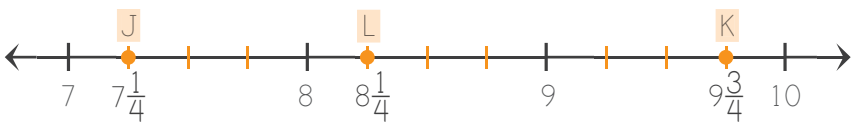


Number Lines with Fractions & Mixed Numbers Additional Practice

1.



2.



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Quadrilateral Classification

1. a. The figure should have two pairs of parallel sides.



b. The figure should have one pair of parallel sides.



2. ☑ polygon ☑ quadrilateral ☑ parallelogram ☑ rectangle
☑ rhombus ☐ trapezoid ☐ trapezium

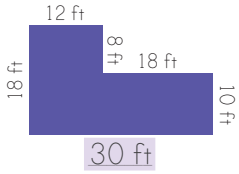
Quadrilateral Classification Additional Practice

1. trapezoid parallelogram rectangle



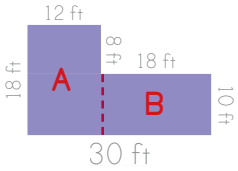
Perimeter & Area of Irregular Shapes

1. a. missing side length: 12 ft + 18 ft = 30 ft



b. Perimeter = 12 ft + 8 ft + 18 ft + 10 ft + 30 ft + 18 ft = 96 ft

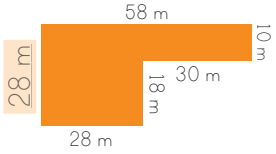
c.



Area A: 12 ft × 18 ft = 216 ft^2
Area B: 18 ft × 10 ft = 180 ft^2
Area of irregular shape: 216 ft^2 + 180 ft^2 = 396 ft^2

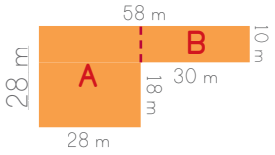
Perimeter & Area of Irregular Shapes Additional Practice

1. a. missing side length: 18 m + 10 m = 28 m



b. Perimeter = 58 m + 10 m + 30 m + 18 m + 28 m + 28 m = 172 m

c.



Area A: 28 m × 28 m = 784 m^2
Area B: 30 m × 10 m = 300 m^2
Area of irregular shape: 784 m^2 + 300 m^2 = 1,084 m^2

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Triangles

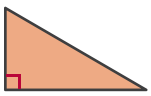
1. a. 

   b. 

2. a. P = 6 cm + 8 cm + 10 cm = 24 cm

   b. $A = \frac{8 \text{ cm} \times 6 \text{ cm}}{2} = \frac{48 \text{ cm}^2}{2} = 24 \text{ cm}^2$

Triangles Additional Practice

1. a. 

   b. 

2. $A = \frac{7 \text{ yd} \times 10 \text{ yd}}{2} = \frac{70 \text{ yd}^2}{2} = 35 \text{ yd}^2$

Numbers in the Billions/Ordinal Numbers

1. 941,200,000,000

2. 80,000,000,000 + 60,000,000 + 500,000

3. twenty-sixth

Numbers in the Billions/Ordinal Numbers Additional Practice

1. 600,000,000,040
   600,000,000,000 + 40

2. fiftieth

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Quotients as Mixed Numbers

1. $5\overline{)14}$ $2\frac{4}{5}$
   -10
   4

2. $9\overline{)128}$ $14\frac{2}{9}$
   $-\ 9$
   38
   -36
   2

Quotients as Mixed Numbers Additional Practice

1. $5\overline{)67}$ $13\frac{2}{5}$
   -5
   17
   -15
   2

2. $10\overline{)339}$ $33\frac{9}{10}$
   -30
   39
   -30
   9

Add & Subtract with Common Denominators/LCM

1. a. $\frac{3}{10} + \frac{2}{10} = \frac{5}{10} = \frac{1}{2}$

   b. $\frac{5}{7} - \frac{3}{7} = \frac{2}{7}$

2. 6: 6, 12, 18, (24), 30
   8: 8, 16, (24), 32, 40
   LCM: 24

Add & Subtract with Common Denominators/LCM Additional Practice

1. a. $\frac{2}{6} + \frac{1}{6} + \frac{2}{6} = \frac{5}{6}$

   b. $\frac{9}{10} - \frac{3}{10} = \frac{6}{10} = \frac{3}{5}$

2. 4: 4, 8, (12), 16, 20
   6: 6, (12), 18, 24, 30
   LCM: 12

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Fractions with Wholes/Comparing Fractions

1. a. $1 - \frac{3}{4} = \frac{4}{4} - \frac{3}{4} = \frac{1}{4}$

b. $1 - \frac{9}{10} = \frac{10}{10} - \frac{9}{10} = \frac{1}{10}$

c. $1 - \frac{7}{9} = \frac{9}{9} - \frac{7}{9} = \frac{2}{9}$

2. $\frac{1}{3}$: Half of 3 is $1\frac{1}{2}$. 1 is less than $1\frac{1}{2}$, so $\frac{1}{3}$ is less than $\frac{1}{2}$.

$\frac{3}{5}$: Half of 5 is $2\frac{1}{2}$. 3 is greater than $2\frac{1}{2}$, so $\frac{3}{5}$ is greater than $\frac{1}{2}$.

$\frac{2}{4}$: Half of 4 is 2, so $\frac{2}{4}$ is equal to $\frac{1}{2}$.

$\frac{3}{3}$: $\frac{3}{3}$ is equal to 1.

Greatest to least: $\frac{3}{3}, \frac{3}{5}, \frac{2}{4}, \frac{1}{3}$

Fractions with Wholes/Comparing Fractions Additional Practice

1. a. $1 - \frac{1}{4} = \frac{4}{4} - \frac{1}{4} = \frac{3}{4}$

b. $1 - \frac{4}{5} = \frac{5}{5} - \frac{4}{5} = \frac{1}{5}$

c. $1 - \frac{5}{6} = \frac{6}{6} - \frac{5}{6} = \frac{1}{6}$

2. $\frac{7}{7}$: $\frac{7}{7}$ is equal to 1.

$\frac{4}{8}$: Half of 8 is 4, so $\frac{4}{8}$ is equal to $\frac{1}{2}$.

$\frac{3}{4}$: Half of 4 is 2. 3 is greater than 2, so $\frac{3}{4}$ is greater than $\frac{1}{2}$.

$\frac{5}{12}$: Half of 12 is 6. 5 is less than 6, so $\frac{5}{12}$ is less than $\frac{1}{2}$.

Least to greatest: $\frac{5}{12}, \frac{4}{8}, \frac{3}{4}, \frac{7}{7}$

Fahrenheit & Celsius

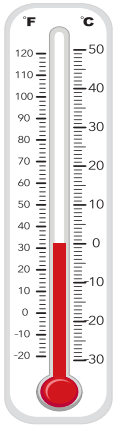
1. $C = (F - 32) \times 5 \div 9$
$C = (50 - 32) \times 5 \div 9$
$C = 18 \times 5 \div 9$
$C = 90 \div 9$
$C = 10$

50 °F = 10 °C

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Fahrenheit & Celsius Additional Practice

1.



0 °C = 32 °F

2. F = 9C ÷ 5 + 32
F = 9 × 20 ÷ 5 + 32
F = 180 ÷ 5 + 32
F = 36 + 32
F = 68

20 °C = 68 °F

Mixed Numbers/Wholes Greater than 1

1. a. $2\frac{1}{4} + 3\frac{2}{4} =$
$5 + \frac{3}{4} =$
$5\frac{3}{4}$

b. $6\frac{3}{5} + 4\frac{2}{5} =$
$10 + \frac{5}{5} =$
11

2. a. $5 - \frac{1}{3} =$
$4\frac{3}{3} - \frac{1}{3} =$
$4\frac{2}{3}$

b. $10 - 1\frac{2}{5} =$
$9\frac{5}{5} - 1\frac{2}{5} =$
$8\frac{3}{5}$

Mixed Numbers/Wholes Greater than 1 Additional Practice

1. a. $3\frac{1}{5} + 1\frac{3}{5} =$
$4 + \frac{4}{5} =$
$4\frac{4}{5}$

b. $5\frac{2}{3} + 4\frac{1}{3} =$
$9 + \frac{3}{3} =$
10

2. a. $7 - \frac{2}{3} =$
$6\frac{3}{3} - \frac{1}{3} =$
$6\frac{2}{3}$

b. $12 - 1\frac{3}{5} =$
$11\frac{5}{5} - 1\frac{3}{5} =$
$10\frac{2}{5}$

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Place Value with Decimals

1. a. hundredths place: 1

   b. tenths place: 5

2. fraction: $\frac{3}{100}$

   decimal number: 0.03

Place Value with Decimals Additional Practice

1. a. tenths place: 4

   b. thousandths place: 2

2. fraction: $\frac{9}{1,000}$

   decimal number: 0.009

Reading & Writing Decimal Numbers

1. a. 73.4

   b. 80.423

2. five and three hundred sixty-four thousandths

Reading & Writing Decimal Numbers Additional Practice

1. 1.28

2. two and five hundred sixteen thousandths

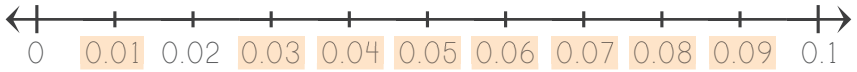
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Decimal Numbers on a Number Line

1. 

2. A 0.43 B 0.48 C 0.42 D 0.46

Decimal Numbers on a Number Line Additional Practice

1. 

2. A 2.4 B 2.7 C 2.1 D 2.9

Equivalent Decimal Numbers/Compare & Order

1. a. 2.02 is simplified.
   b. 02.0421 ⟶ 2.0421
   c. 02.420 ⟶ 2.42
   d. 2.2200 ⟶ 2.22

2. Compare the tenths place:
   2.02
   2.0421
   2.42 ⟵ greatest
   2.22 ⟵ second greatest

   Compare the hundredths place:
   2.02 ⟵ least
   2.0421

   Least to greatest: 2.02, 2.0421, 2.22, 2.42

Equivalent Decimal Numbers/Compare & Order Additional Practice

1. a. 0.03360 ⟶ 0.0336
   b. 0.03310 ⟶ 0.0331
   c. 0.03610 ⟶ 0.0361
   d. 0.3600 ⟶ 0.36

2. Compare the tenths place:
   0.0336
   0.0331
   0.0361
   0.36 ⟵ greatest

   Compare the thousandths place:
   0.0336
   0.0331
   0.0361 ⟵ second greatest

   Compare the ten-thousandths place:
   0.0336
   0.0331 ⟵ least

   Least to greatest: 0.0331, 0.0336, 0.0361, 0.36

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Adding & Subtracting Decimal Numbers

1.
$$\begin{array}{r} 4.002 \\ {}^{1}6.300 \\ +18.060 \\ \hline 28.362 \end{array}$$

2.
$$\begin{array}{r} {}^{8}\not{9}\,{}^{1}\not{2}.538 \\ -\ 5.210 \\ \hline 87.328 \end{array}$$

Adding & Subtracting Decimal Numbers Additional Practice

1.
$$\begin{array}{r} {}^{1\ 1} \\ 32.9031 \\ 16.4220 \\ +\ 4.0000 \\ \hline 53.3251 \end{array}$$

2.
$$\begin{array}{r} {}^{6}\not{7}\,{}^{7}5.\not{8}\,{}^{1}21 \\ -\ 6.380 \\ \hline 69.441 \end{array}$$

Rounding Decimal Numbers

1. a. tenths place:
   3.7534
   round up
   3.8

   b. hundredths place:
   3.7534
   round down
   3.75

2. a. thousandths place:
   64.8327
   round up
   64.833

   b. thousandths place:
   8.0954
   round down
   8.095

Rounding Decimal Numbers Additional Practice

1. a. tenths place:
   5.7835
   round up
   5.8

   b. hundredths place:
   5.7835
   round down
   5.78

2. a. thousandths place:
   4.3074
   round down
   4.307

   b. thousandths place:
   9.2546
   round up
   9.255

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Converting Decimals & Percents to Fractions

1. a. $0.6 = \frac{6}{10} = \frac{3}{5}$

   b. $0.85 = \frac{85}{100} = \frac{17}{20}$

   c. $4.025 = 4\frac{25}{1{,}000} = 4\frac{1}{40}$

2. a. $40\% = \frac{40}{100} = \frac{2}{5}$

   b. $5\% = \frac{5}{100} = \frac{1}{20}$

   c. $36\% = \frac{36}{100} = \frac{9}{25}$

Converting Decimals & Percents to Fractions Additional Practice

1. a. $0.5 = \frac{5}{10} = \frac{1}{2}$

   b. $0.65 = \frac{65}{100} = \frac{13}{20}$

   c. $7.001 = 7\frac{1}{1{,}000}$

2. a. $45\% = \frac{45}{100} = \frac{9}{20}$

   b. $4\% = \frac{4}{100} = \frac{1}{25}$

   c. $90\% = \frac{90}{100} = \frac{9}{10}$

Probability

1. a. land on 1? $\frac{1}{6}$

   b. an even number? $\frac{3}{6} = \frac{1}{2}$

   c. a number greater than 2? $\frac{4}{6} = \frac{2}{3}$

2. $100\% - 20\% = 80\%$

Probability Additional Practice

1. a. land on 2 or 3? $\frac{2}{6} = \frac{1}{3}$

   b. an odd number? $\frac{3}{6} = \frac{1}{2}$

   c. a number less than 6? $\frac{5}{6}$

2. $100\% - 60\% = 40\%$

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Multiplying Fractions by Fractions/Equivalent Fractions

1. a. $\frac{2}{3} \times \frac{4}{5} = \frac{8}{15}$

   b. $\frac{5}{7} \times \frac{3}{5} = \frac{15}{35} = \frac{3}{7}$

2. $\frac{9}{12} \div 3 = \frac{3}{4}$

   $\frac{12}{15} \div 3 = \frac{4}{5}$

   $\frac{30}{40} \div 10 = \frac{3}{4}$

   $\frac{15}{24} \div 3 = \frac{5}{8}$

   $\frac{3}{4}$ | $\frac{9}{12}$ ~~$\frac{12}{15}$~~ $\frac{30}{40}$ ~~$\frac{15}{24}$~~

Multiplying Fractions by Fractions/Equivalent Fractions Additional Practice

1. a. $\frac{3}{4} \times \frac{5}{6} = \frac{15}{24} = \frac{5}{8}$

   b. $\frac{7}{10} \times \frac{5}{7} = \frac{35}{70} = \frac{1}{2}$

2. $\frac{6}{9} \div 3 = \frac{2}{3}$

   $\frac{10}{15} \div 5 = \frac{2}{3}$

   16 and 27 do not have common factors.
   $\frac{16}{27}$ is in simplest form.

   $\frac{200}{300} \div 100 = \frac{2}{3}$

   $\frac{2}{3}$ | $\frac{6}{9}$ $\frac{10}{15}$ ~~$\frac{16}{27}$~~ $\frac{200}{300}$

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CONVERTING IMPROPER FRACTIONS TO WHOLE OR MIXED NUMBERS

Video Lesson

Different strategies may be used to convert to improper fractions. A sample strategy is shown for each problem below.

Top Left Box

$\frac{11}{5} = \frac{5}{5} + \frac{5}{5} + \frac{1}{5}$

$= 1 + 1 + \frac{1}{5}$

$= 2\frac{1}{5}$



Top Right Box

$4\overline{)10}$ $2\frac{2}{4} = 2\frac{1}{2}$

$-\ 8$

2

Bottom Box

$4\frac{5}{9} + 7\frac{8}{9}$

$= 11\frac{13}{9}$

$= 11 + 1\frac{4}{9}$

$= 12\frac{4}{9}$

Practice

1. a. (given)

b. $\frac{11}{4}$, $2\frac{3}{4}$

c. $\frac{23}{6}$, $3\frac{5}{6}$

d. $\frac{14}{3}$, $4\frac{2}{3}$

e. $\frac{53}{9}$, $5\frac{8}{9}$

2. a. (given)

b. 9

c. 5

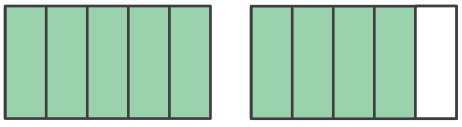
d. 9

3. Different strategies may be used to convert improper fractions.

a. $\frac{9}{5} = \frac{5}{5} + \frac{4}{5}$

$= 1 + \frac{4}{5}$

$= 1\frac{4}{5}$



b. $20\overline{)47}$ $2\frac{7}{20}$

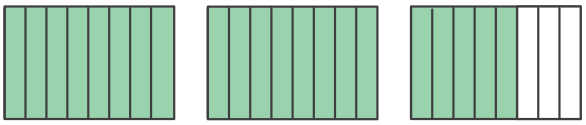
-40

7

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c. $3\overline{)17}$ $5\frac{2}{3}$
-15
2

d. $\frac{21}{8} = \frac{8}{8} + \frac{8}{8} + \frac{5}{8}$
$= 1 + 1 + \frac{5}{8}$
$= 2\frac{5}{8}$

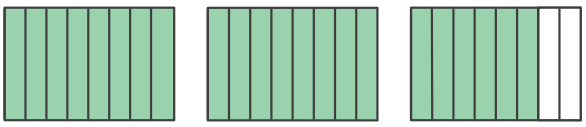


4. Different strategies may be used.

a. $10\overline{)16}$ $1\frac{6}{10} = 1\frac{3}{5}$
-10
6

$1\frac{6}{10}$ $2\frac{1}{6}$ $1\frac{3}{5}$ $1\frac{1}{6}$

b. $\frac{22}{8} = \frac{8}{8} + \frac{8}{8} + \frac{6}{8}$
$= 1 + 1 + \frac{6}{8}$
$= 2\frac{6}{8} = 2\frac{3}{4}$



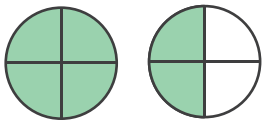
3 $2\frac{3}{5}$ $2\frac{6}{8}$ $3\frac{1}{4}$

c. $4\overline{)19}$ $4\frac{3}{4}$
-16
3

$3\frac{3}{4}$ $4\frac{3}{4}$ $4\frac{1}{2}$ $4\frac{2}{4}$

5. Different strategies may be used.

a. $\frac{3}{4} + \frac{3}{4}$
$= \frac{6}{4}$
$= 1\frac{2}{4}$
$= 1\frac{1}{2}$



b. $\frac{2}{7} + \frac{4}{7} + \frac{3}{7} + \frac{5}{7}$
$= \frac{14}{7}$
$= 2$

c. $\frac{5}{16} + \frac{15}{16} = \frac{20}{16}$

$16\overline{)20}$ $1\frac{4}{16} = 1\frac{1}{4}$
-16
4

d. $\frac{1}{9} + \frac{4}{9} + \frac{2}{9} + \frac{2}{9}$
$= \frac{9}{9}$
$= 1$

6. Different strategies may be used. Work for each problem is shown below.

$\frac{5}{2} = 2\frac{1}{2}$	A $\frac{4}{3} = 1\frac{1}{3}$	B $\frac{11}{6} = 1\frac{5}{6}$	C $\frac{13}{4} = 3\frac{1}{4}$
D $\frac{25}{6} = 4\frac{1}{6}$	E $\frac{31}{5} = 6\frac{1}{5}$	F $\frac{23}{3} = 7\frac{2}{3}$	G $\frac{19}{7} = 2\frac{5}{7}$
H $\frac{31}{4} = 7\frac{3}{4}$	I $\frac{24}{11} = 2\frac{2}{11}$	J $\frac{44}{5} = 8\frac{4}{5}$	K $\frac{17}{9} = 1\frac{8}{9}$
L $\frac{15}{8} = 1\frac{7}{8}$	M $\frac{15}{4} = 3\frac{3}{4}$	N $\frac{25}{12} = 2\frac{1}{12}$	O $\frac{27}{8} = 3\frac{3}{8}$

A
$$3\overline{)4} = 1\tfrac{1}{3}, \quad -3, \quad 1$$

B
$$6\overline{)11} = 1\tfrac{5}{6}, \quad -6, \quad 5$$

C
$$4\overline{)13} = 3\tfrac{1}{4}, \quad -12, \quad 1$$

D
$$6\overline{)25} = 4\tfrac{1}{6}, \quad -24, \quad 1$$

E
$$5\overline{)31} = 6\tfrac{1}{5}, \quad -30, \quad 1$$

F
$$3\overline{)23} = 7\tfrac{2}{3}, \quad -21, \quad 2$$

G
$$7\overline{)19} = 2\tfrac{5}{7}, \quad -14, \quad 5$$

H
$$4\overline{)31} = 7\tfrac{3}{4}, \quad -28, \quad 3$$

I
$$11\overline{)24} = 2\tfrac{2}{11}, \quad -22, \quad 2$$

J
$$5\overline{)44} = 8\tfrac{4}{5}, \quad -40, \quad 4$$

K
$$9\overline{)17} = 1\tfrac{8}{9}, \quad -9, \quad 8$$

L
$$8\overline{)15} = 1\tfrac{7}{8}, \quad -8, \quad 7$$

M
$$4\overline{)15} = 3\tfrac{3}{4}, \quad -12, \quad 3$$

N
$$12\overline{)25} = 2\tfrac{1}{12}, \quad -24, \quad 1$$

O
$$8\overline{)27} = 3\tfrac{3}{8}, \quad -24, \quad 3$$

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Review

1. a. $\frac{2}{3} \times \frac{4}{5} = \frac{8}{15}$

b. $\frac{8}{11} \times \frac{8}{11} = \frac{64}{121}$

2. a. (given)

b. $\frac{2}{3} \times \frac{4}{4} = \frac{8}{12}$

c. $\frac{3}{4} \times \frac{3}{3} = \frac{9}{12}$

3. There are 5 numbers greater than 1.

$\frac{5}{6}$

4. a. $0.5 = \frac{5}{10} = \frac{1}{2}$

b. $1.8 = 1\frac{8}{10} = 1\frac{4}{5}$

5. a. $90\% = \frac{90}{100} = \frac{9}{10}$

b. $65\% = \frac{65}{100} = \frac{13}{20}$

6. Compare the tenths place:
9.0347
9.0348
9.347 ⟵ greatest

Compare the ten-thousandths place:
9.0347
9.0348

Greatest to least: 9.347, 9.0348, 9.0347

7. a. 5.06825
round up
5.1

b. 5.06825
round down
5.068

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GREATEST COMMON FACTOR

Video Lesson

Top Box

15: 1, 3, 5, 15
30: 1, 2, 3, 5, 6, 10, 15, 30

GCF: 15

Bottom Left Box

6 is a factor of 24.
The GCF of 6 and 24 is 6.

$\frac{6 \div 6}{24 \div 6} = \frac{1}{4}$

Bottom Right Box

12: 1, 2, 3, 4, 6, 12
20: 1, 2, 4, 5, 10, 20

GCF: 4

$\frac{12 \div 4}{20 \div 4} = \frac{3}{5}$

Practice

1. a. 6: 1, 2, 3, 6
18: 1, 2, 3, 6, 9, 18

GCF of 6 and 18: 6

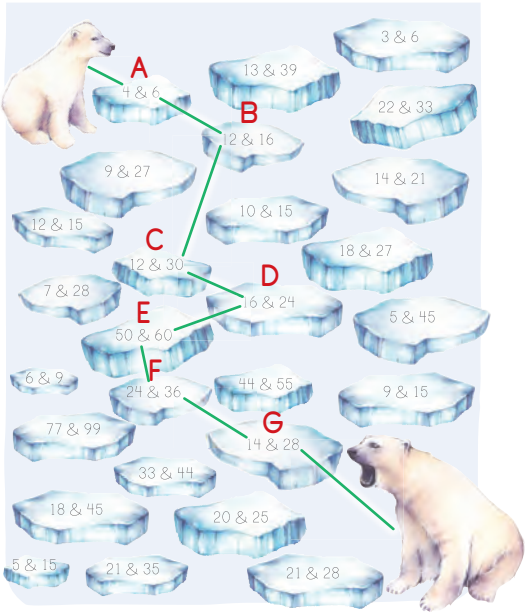
b. 8: 1, 2, 4, 8
20: 1, 2, 4, 5, 10, 20

GCF of 8 and 20: 4

c. 12: 1, 2, 3, 4, 6, 12
30: 1, 2, 3, 5, 6, 10, 15, 30

GCF of 12 and 30: 6

2. For numbers to have a GCF that is a multiple of 2, both numbers must be even. Any ice chunks that have an odd number will not be on the path. Work showing the GCFs on the path is shown on the next page.



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A
4: 1, 2, 4
6: 1, 2, 3, 6

GCF: 2

B
12: 1, 2, 3, 4, 6, 12
16: 1, 2, 4, 8, 16

GCF: 4

C
12: 1, 2, 3, 4, 6, 12
30: 1, 2, 3, 5, 6, 10, 15, 30

GCF: 6

D
16: 1, 2, 4, 8, 16
24: 1, 2, 3, 4, 6, 8, 12, 24

GCF: 8

E
50: 1, 2, 5, 10, 25, 50
60: 1, 2, 3, 4, 5, 6, 10, 12, 15, 20, 30, 60

GCF: 10

F
24: 1, 2, 3, 4, 6, 8, 12, 24
36: 1, 2, 3, 4, 6, 9, 12, 18, 36

GCF: 12

G
14 is a factor of 28.
The GCF of 14 and 28 is 14.

3. Work to find the GCF for each fraction is shown below the chart.

GCF of 3	GCF of 4	GCF of 5	GCF of 6
$\frac{6}{9}$	$\frac{8}{12}$	$\frac{15}{20}$	$\frac{12}{18}$
GCF of 7	**GCF of 8**	**GCF of 9**	**GCF of 10**
$\frac{21}{49}$	$\frac{8}{32}$	$\frac{9}{36}$	$\frac{60}{70}$

$\frac{15}{20}$
15: 1, 3, 5, 15
20: 1, 2, 4, 5, 10, 20

GCF: 5

$\frac{12}{18}$
12: 1, 2, 3, 4, 6, 12
18: 1, 2, 3, 6, 9, 18

GCF: 6

$\frac{21}{49}$
21: 1, 3, 7, 21
49: 1, 7, 49

GCF: 7

$\frac{8}{12}$
8: 1, 2, 4, 8
12: 1, 2, 3, 4, 6, 12

GCF: 4

$\frac{8}{32}$
8 is a factor of 32. The GCF of 8 and 32 is 8.

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$\frac{60}{70}$

60: 1, 2, 3, 4, 5, 6, 10, 12, 15, 20, 30, 60

70: 1, 2, 5, 7, 10, 14, 35, 70

GCF: 10

$\frac{9}{36}$

9 is a factor of 36. The GCF of 9 and 36 is 9.

4. a. (given)

b. $\frac{15 \div 5}{20 \div 5} = \frac{3}{4}$

c. $\frac{12 \div 6}{18 \div 6} = \frac{2}{3}$

d. $\frac{21 \div 7}{49 \div 7} = \frac{3}{7}$

e. $\frac{8 \div 4}{12 \div 4} = \frac{2}{3}$

f. $\frac{8 \div 8}{32 \div 8} = \frac{1}{4}$

g. $\frac{60 \div 10}{70 \div 10} = \frac{6}{7}$

h. $\frac{9 \div 9}{36 \div 9} = \frac{1}{4}$

Review

1. a. $\frac{1}{3} + \frac{2}{3} + \frac{2}{3} = \frac{5}{3} = 1\frac{2}{3}$

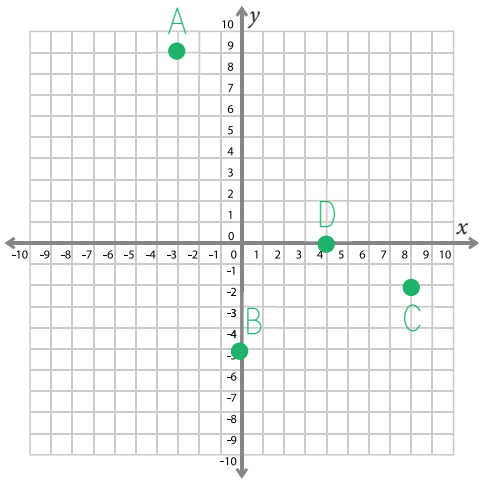
b. $\frac{7}{8} + \frac{3}{8} + \frac{1}{8} = \frac{11}{8}$

$$\begin{array}{r} 1\frac{3}{8} \\ 8\overline{)11} \\ -\ 8 \\ \hline 3 \end{array}$$

2. $9\frac{1}{2}$ cm, $3\frac{3}{4}$ in

3. 25.428

4.



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USING THE LCM TO FIND COMMON DENOMINATORS

Video Lesson

multiples of 4: 4, 8, 12, 16, 20
multiples of 6: 6, 12, 18, 24, 30

LCM of 4 and 6: 12

$\frac{3}{4} = \frac{9}{12}$ $\frac{1}{6} = \frac{2}{12}$

$\frac{3}{4} - \frac{1}{6} = \frac{9}{12} - \frac{2}{12} = \frac{7}{12}$

Practice

1. a. multiples of 2: 2, 4, 6, 8, 10
multiples of 4: 4, 8, 12, 16, 20

LCM of 2 and 4: 4

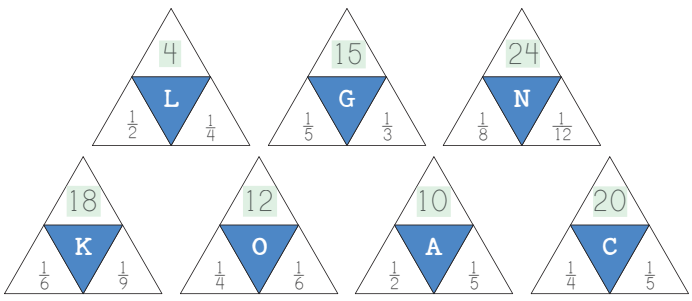
equivalent fractions with the LCD:
$\frac{1}{2} = \frac{2}{4}$ $\frac{1}{4} = \frac{1}{4}$

b. multiples of 6: 6, 12, 18, 24, 30
multiples of 4: 4, 8, 12, 16, 20

LCM of 6 and 4: 12

equivalent fractions with the LCD:
$\frac{5}{6} = \frac{10}{12}$ $\frac{3}{4} = \frac{9}{12}$

2. Work for each letter is shown on the right.



L
multiples of 2: 2, 4, 6, 8, 10
multiples of 4: 4, 8, 12, 16, 20
LCM of 2 and 4: 4

G
multiples of 5: 5, 10, 15, 20, 25
multiples of 3: 3, 6, 9, 12, 15
LCM of 5 and 3: 15

N
multiples of 8: 8, 16, 24, 32, 40
multiples of 12: 12, 24, 36, 48, 60
LCM of 8 and 12: 24

K
multiples of 6: 6, 12, 18, 24, 30
multiples of 9: 9, 18, 27, 36, 45
LCM of 6 and 9: 18

O
multiples of 4: 4, 8, 12, 16, 20
multiples of 6: 6, 12, 18, 24, 30
LCM and 4 and 6: 12

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A
multiples of 2: 2, 4, 6, 8, 10
multiples of 5: 5, 10, 15, 20, 25
LCM of 2 and 5: 10

C
multiples of 4: 4, 8, 12, 16, 20
multiples of 5: 5, 10, 15, 20, 25
LCM of 4 and 5: 20

I have numbers on my face but no 13 any place.
What am I?

A	N	A	N	A	L	O	G	C	L	O	C	K
10	24	10	24	10	4	12	15	20	4	12	20	18

3. a. multiples of 4: 4, 8, 12, 16, 20
multiples of 5: 5, 10, 15, 20, 25

LCM of 4 and 5: 20

$\frac{1}{4} = \frac{5}{20}$ $\frac{1}{5} = \frac{4}{20}$

$\frac{1}{4} + \frac{1}{5} = \frac{5}{20} + \frac{4}{20} = \frac{9}{20}$

b. multiples of 3: 3, 6, 9, 12, 15
multiples of 6: 6, 12, 18, 24, 30

LCM of 3 and 6: 6

$\frac{5}{6} = \frac{5}{6}$ $\frac{1}{3} = \frac{2}{6}$

$\frac{5}{6} - \frac{1}{3} = \frac{5}{6} - \frac{2}{6} = \frac{3}{6} = \frac{1}{2}$

c. multiples of 14: 14, 28, 42, 56, 70
multiples of 7: 7, 14, 21, 28, 35

LCM of 14 and 7: 14

$\frac{3}{14} = \frac{3}{14}$ $\frac{4}{7} = \frac{8}{14}$

$\frac{3}{14} + \frac{4}{7} = \frac{3}{14} + \frac{8}{14} = \frac{11}{14}$

4. a. multiples of 2: 2, 4, 6, 8, 10
multiples of 4: 4, 8, 12, 16, 20

LCM of 2 and 4: 4

$\frac{1}{2} = \frac{2}{4}$ $\frac{1}{4} = \frac{1}{4}$

$3\frac{1}{2} + 3\frac{1}{4} \rightarrow 3\frac{2}{4} + 3\frac{1}{4} = 6\frac{3}{4}$

b. multiples of 3: 3, 6, 9, 12, 15
multiples of 4: 4, 8, 12, 16, 20

LCM of 3 and 4: 12

$\frac{2}{3} = \frac{8}{12}$ $\frac{1}{4} = \frac{3}{12}$

$6\frac{2}{3} + 2\frac{1}{4} \rightarrow 6\frac{8}{12} + 2\frac{3}{12} = 8\frac{11}{12}$

c. multiples of 10: 10, 20, 30, 40, 50
multiples of 5: 5, 10, 15, 20, 25

LCM of 10 and 5: 10

$\frac{9}{10} = \frac{9}{10}$ $\frac{2}{5} = \frac{4}{10}$

$8\frac{9}{10} - 3\frac{2}{5} \rightarrow 8\frac{9}{10} - 3\frac{4}{10} = 5\frac{5}{10} = 5\frac{1}{2}$

d. multiples of 2: 2, 4, 6, 8, 10
multiples of 3: 3, 6, 9, 12, 15

LCM of 2 and 3: 6

$\frac{1}{2} = \frac{3}{6}$ $\frac{1}{3} = \frac{2}{6}$

$7\frac{1}{2} - 4\frac{1}{3} \rightarrow 7\frac{3}{6} - 4\frac{2}{6} = 3\frac{1}{6}$

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5. a. multiples of 3: 3, 6, 9, 12, 15

multiples of 6: 6, 12, 18, 24, 30

LCM of 3 and 6: 6

$\frac{2}{3} = \frac{4}{6}$ $\frac{5}{6} = \frac{5}{6}$

$\frac{2}{3} < \frac{5}{6}$

b. multiples of 8: 8, 16, 24, 32, 40

multiples of 10: 10, 20, 30, 40, 50

LCM of 8 and 10: 40

$\frac{5}{8} = \frac{25}{40}$ $\frac{7}{10} = \frac{28}{40}$

$\frac{5}{8} < \frac{7}{10}$

6. a. multiples of 5: 5, 10, 15, 20, 25

multiples of 10: 10, 20, 30, 40, 50

LCM of 5 and 10: 10

$\frac{4}{5} = \frac{8}{10}$ $\frac{7}{10} = \frac{7}{10}$ $\frac{3}{5} = \frac{6}{10}$

least to greatest: $\frac{3}{5}, \frac{7}{10}, \frac{4}{5}$

b. multiples of 3: 3, 6, 9, 12, 15

multiples of 12: 12, 24, 36, 48, 60

multiples of 4: 4, 8, 12, 16, 20

LCM of 3, 12, and 4: 12

$\frac{1}{3} = \frac{4}{12}$ $\frac{5}{12} = \frac{5}{12}$ $\frac{3}{4} = \frac{9}{12}$

least to greatest: $\frac{1}{3}, \frac{5}{12}, \frac{3}{4}$

Review

1. factors of 6: 1, 2, 3, 6

factors of 10: 1, 2, 5, 10

GCF of 6 and 10: 2

2. $\frac{3}{5} \overset{\times 2}{=} \frac{6}{10} \overset{\times 3}{=} \frac{18}{30}$

3. a. $\frac{4}{5} + \frac{3}{5}$

$= \frac{7}{5}$

$= 1\frac{2}{5}$

b. $\frac{5}{24} + \frac{7}{24} + \frac{19}{24} + \frac{1}{24}$

$= \frac{32}{24}$

$= 1\frac{8}{24}$

$= 1\frac{1}{3}$

4. $\frac{3}{4} \times \frac{1}{2} = \frac{3}{8}$

5. a. 3×10^2

The exponent is 2. Add 2 zeros after 3.

$3 \times 10^2 = 300$

b. $6{,}200{,}000 \div 10^4$

The exponent is 4.

Take 4 zeros off of 6,200,000.

$6{,}200{,}000 \div 10^4 = 620$

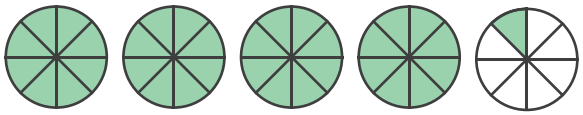
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CONVERTING MIXED NUMBERS TO IMPROPER FRACTIONS

Video Lesson

Different strategies may be used to find the improper fraction. A sample strategy is shown for each problem below.

Top Left Box



$4\frac{1}{8} = \frac{8}{8} + \frac{8}{8} + \frac{8}{8} + \frac{8}{8} + \frac{1}{8} = \frac{33}{8}$

Top Right Box

$11\frac{3}{5}$ (+ ↑, × ↓)

$\frac{5 \times 11 + 3}{5} = \frac{58}{5}$

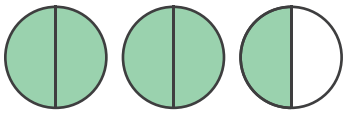
Bottom Box

$2\frac{2}{9}$

$= \frac{9}{9} + \frac{9}{9} + \frac{2}{9} = \frac{20}{9}$

Practice

1. a.



$2\frac{1}{2} = \frac{2}{2} + \frac{2}{2} + \frac{1}{2} = \frac{5}{2}$

b.



$4\frac{2}{3} = \frac{3}{3} + \frac{3}{3} + \frac{3}{3} + \frac{3}{3} + \frac{2}{3} = \frac{14}{3}$

2. a. $2\frac{2}{3}$

$= \frac{3}{3} + \frac{3}{3} + \frac{2}{3} = \frac{8}{3}$

b. $3\frac{1}{8}$

$= \frac{8}{8} + \frac{8}{8} + \frac{8}{8} + \frac{1}{8} = \frac{25}{8}$

c. $1\frac{4}{5}$

$= \frac{5}{5} + \frac{4}{5} = \frac{9}{5}$

3. a. $5\frac{3}{4}$ (+ ↑, × ↓)

$\frac{4 \times 5 + 3}{4} = \frac{23}{4}$

b. $6\frac{2}{7}$ (+ ↑, × ↓)

$\frac{7 \times 6 + 2}{7} = \frac{44}{7}$

c. $7\frac{5}{6}$ (+ ↑, × ↓)

$\frac{6 \times 7 + 5}{6} = \frac{47}{6}$

d. $6\frac{7}{8}$ (+ ↑, × ↓)

$\frac{8 \times 6 + 7}{8} = \frac{55}{8}$

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4. Different strategies may be used to find the improper fraction.

a. $7\frac{4}{5}$

$$\frac{5 \times 7 + 4}{5} = \frac{39}{5}$$

b. $6\frac{3}{11}$

$$\frac{11 \times 6 + 3}{11} = \frac{69}{11}$$

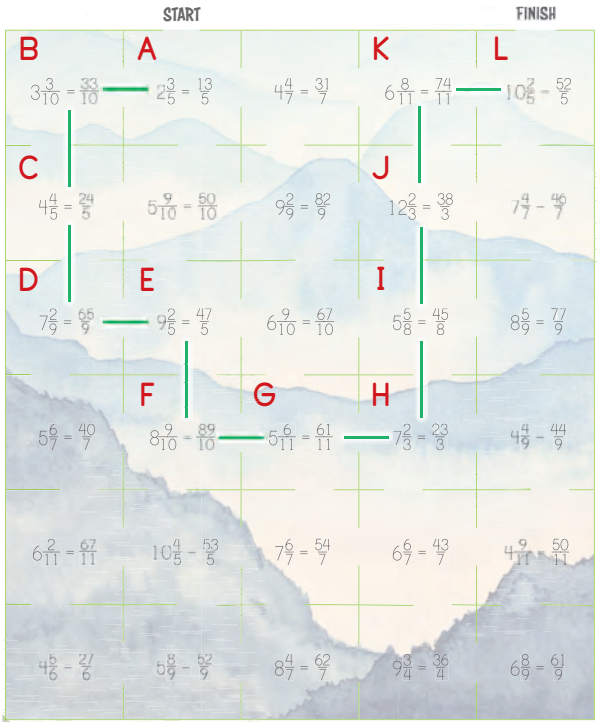
c. $12\frac{2}{3}$

$$\frac{3 \times 12 + 2}{3} = \frac{38}{3}$$

d. $5\frac{5}{12}$

$$\frac{12 \times 5 + 5}{12} = \frac{65}{12}$$

5. Work for each problem is shown at the right.



A $2\frac{3}{5}$

$$\frac{5 \times 2 + 3}{5} = \frac{13}{5}$$

B $3\frac{3}{10}$

$$\frac{10 \times 3 + 3}{10} = \frac{33}{10}$$

C $4\frac{4}{5}$

$$\frac{5 \times 4 + 4}{5} = \frac{24}{5}$$

D $7\frac{2}{9}$

$$\frac{9 \times 7 + 2}{9} = \frac{65}{9}$$

E $9\frac{2}{5}$

$$\frac{5 \times 9 + 2}{5} = \frac{47}{5}$$

F $8\frac{9}{10}$

$$\frac{10 \times 8 + 9}{10} = \frac{89}{10}$$

G $5\frac{6}{11}$

$$\frac{11 \times 5 + 6}{11} = \frac{61}{11}$$

H $7\frac{2}{3}$

$$\frac{3 \times 7 + 2}{3} = \frac{23}{3}$$

I $5\frac{5}{8}$

$$\frac{8 \times 5 + 5}{8} = \frac{45}{8}$$

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J $12\frac{2}{3}$

$\frac{3 \times 12 + 2}{3} = \frac{38}{3}$

K $6\frac{8}{11}$

$\frac{11 \times 6 + 8}{11} = \frac{74}{11}$

L $10\frac{2}{5}$

$\frac{5 \times 10 + 2}{5} = \frac{52}{5}$

Review

1. a. multiples of 4: 4, 8, 12, 16, 20
multiples of 3: 3, 6, 9, 12, 15
LCM of 4 and 3: 12

$\frac{1}{4} = \frac{3}{12}$ $\frac{1}{3} = \frac{4}{12}$

$\frac{1}{4} + \frac{1}{3} = \frac{3}{12} + \frac{4}{12} = \frac{7}{12}$

b. multiples of 6: 6, 12, 18, 24, 30
multiples of 4: 4, 8, 12, 16, 20
LCM of 6 and 4: 12

$\frac{5}{6} = \frac{10}{12}$ $\frac{1}{4} = \frac{3}{12}$

$\frac{5}{6} - \frac{1}{4} = \frac{10}{12} - \frac{3}{12} = \frac{7}{12}$

c. multiples of 10: 10, 20, 30, 40, 50
multiples of 6: 6, 12, 18, 24, 30
LCM of 10 and 6: 30

$\frac{7}{10} = \frac{21}{30}$ $\frac{1}{6} = \frac{5}{30}$

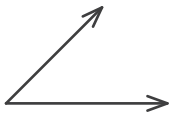
$\frac{7}{10} - \frac{1}{6} = \frac{21}{30} - \frac{5}{30} = \frac{16}{30} = \frac{8}{15}$

2. a. $0.6 = \frac{6}{10} = \frac{3}{5}$

b. $5.001 = 5\frac{1}{1{,}000}$

3. Hey, diddle diddle, the median's the middle.
You add then divide for the mean.
The mode is the one that you see the most,
And the range is the difference between.

4. Angle orientation and placement may vary, but the measure should be 45°.



5.
$$\begin{array}{r} \$\cancel{5}^{4}\,\cancel{0}^{1}6.\cancel{9}^{8}\,^{1}1 \\ -\ \$7.32 \\ \hline \$49.59 \end{array}$$

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FRACTION PRACTICE

Practice

1. a. $\frac{9}{36} \div 9 \div 9 = \frac{1}{4}$

b. $\frac{5}{25} \div 5 \div 5 = \frac{1}{5}$

$9\frac{5}{25} = 9\frac{1}{5}$

c. $\frac{14}{35} \div 7 \div 7 = \frac{2}{5}$

d. $\frac{15}{12} \div 3 \div 3 = \frac{5}{4}$

2. a. denominators

b. amount

c. whole

d. factor

e. greater

f. multiple

g. fraction

h. less

3. a. $7 + \frac{2}{3} = 7\frac{2}{3}$

b. $4 + 9\frac{1}{2} = 13\frac{1}{2}$

c. $\frac{7}{10} - \frac{3}{10} = \frac{4}{10} = \frac{2}{5}$

4. a. $\frac{1}{5} + \frac{1}{4}$

$= \frac{1}{5} \times \frac{4}{4} + \frac{1}{4} \times \frac{5}{5}$

$= \frac{4}{20} + \frac{5}{20}$

$= \frac{9}{20}$

b. $\frac{2}{9} + \frac{1}{3}$

$= \frac{2}{9} + \frac{1}{3} \times \frac{3}{3}$

$= \frac{2}{9} + \frac{3}{9}$

$= \frac{5}{9}$

c. $\frac{3}{4} - \frac{3}{10}$

$= \frac{3}{4} \times \frac{5}{5} - \frac{3}{10} \times \frac{2}{2}$

$= \frac{15}{20} - \frac{6}{20}$

$= \frac{9}{20}$

5. a. $2\frac{2}{3} - \frac{1}{4}$

$= 2\frac{8}{12} - \frac{3}{12}$

$= 2\frac{5}{12}$

b. $7\frac{5}{6} - \frac{2}{3}$

$= 7\frac{5}{6} - \frac{4}{6}$

$= 7\frac{1}{6}$

c. $4\frac{2}{3} - 2\frac{1}{5}$

$= 4\frac{10}{15} - 2\frac{3}{15}$

$= 2\frac{7}{15}$

6. a. $1 - \frac{7}{8}$

$= \frac{8}{8} - \frac{7}{8}$

$= \frac{1}{8}$

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b. $10 - 3\frac{1}{4}$

$= 9\frac{4}{4} - 3\frac{1}{4}$

$= \boxed{6\frac{3}{4}}$

c. $6 - \frac{2}{3}$

$= 5\frac{3}{3} - \frac{2}{3}$

$= \boxed{5\frac{1}{3}}$

7. a. $3\frac{4}{5}$

$\frac{5 \times 3 + 4}{5} = \frac{19}{5}$

$3\frac{4}{5} + \frac{7}{5}$

$= \frac{19}{5} + \frac{7}{5}$

$= \boxed{\frac{26}{5}}$

b. $7\frac{1}{2}$

$\frac{2 \times 7 + 1}{2} = \frac{15}{2}$

$\frac{4}{3} + 7\frac{1}{2}$

$= \frac{4}{3} + \frac{15}{2}$

$= \frac{8}{6} + \frac{45}{6}$

$= \boxed{\frac{53}{6}}$

c. $3\overline{)7}\ 2\frac{1}{3}$

$\frac{-6}{1}$

$2\frac{2}{3} + \frac{7}{3}$

$= 2\frac{2}{3} + 2\frac{1}{3}$

$= 4 + \frac{3}{3}$

$= \boxed{5}$

d. $2\overline{)5}\ 2\frac{1}{2}$

$\frac{-4}{1}$

$\frac{5}{2} + 4\frac{4}{5}$

$= 2\frac{1}{2} + 4\frac{4}{5}$

$= 2\frac{5}{10} + 4\frac{8}{10}$

$= 6 + \frac{13}{10}$

$= 6 + 1\frac{3}{10}$

$= \boxed{7\frac{3}{10}}$

8. Any method may be used to solve the problems.

a. $5\frac{3}{8} - \frac{9}{4}$

$= \frac{43}{8} - \frac{9}{4}$

$= \frac{43}{8} - \frac{18}{8}$

$= \boxed{\frac{25}{8}}$ or $\boxed{3\frac{1}{8}}$

b. $\frac{11}{4} - 1\frac{1}{4}$

$= 2\frac{3}{4} - 1\frac{1}{4}$

$= 1\frac{2}{4}$

$= \boxed{1\frac{1}{2}}$ or $\boxed{\frac{3}{2}}$

c. $6\frac{4}{5} - \frac{10}{3}$

$= 6\frac{4}{5} - 3\frac{1}{3}$

$= 6\frac{12}{15} - 3\frac{5}{15}$

$= \boxed{3\frac{7}{15}}$ or $\boxed{\frac{52}{15}}$

d. $\frac{10}{3} - 1\frac{1}{4}$

$= \frac{10}{3} - \frac{5}{4}$

$= \frac{40}{12} - \frac{15}{12}$

$= \boxed{\frac{25}{12}}$ or $\boxed{2\frac{1}{12}}$

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CONVERTING FRACTIONS TO PERCENTS

Video Lesson

$\frac{17}{20} \times \frac{5}{5} = \frac{85}{100} = 85\%$

$85\% > 82\%$

$\frac{17}{20} > 82\%$

Practice

1. a. $\frac{32}{100} = 32\%$

b. $\frac{4}{100} = 4\%$

c. $\frac{71}{100} = 71\%$

2. a. (given)

b. $\frac{23}{50} \times \frac{2}{2} = \frac{46}{100} = 46\%$

c. $\frac{2}{5} \times \frac{20}{20} = \frac{40}{100} = 40\%$

d. $\frac{3}{20} \times \frac{5}{5} = \frac{15}{100} = 15\%$

3. a. (given)

b. $15\% = \frac{15}{100} = \frac{3}{20}$

c. $50\% = \frac{50}{100} = \frac{1}{2}$

d. $65\% = \frac{65}{100} = \frac{13}{20}$

4. a. $\frac{3}{4} \times \frac{25}{25} = \frac{75}{100} = 75\%$

$80\% > 75\%$

$80\% > \frac{3}{4}$

b. $\frac{3}{20} \times \frac{5}{5} = \frac{15}{100} = 15\%$

$15\% = \frac{3}{20}$

c. $\frac{9}{25} \times \frac{4}{4} = \frac{36}{100} = 36\%$

$36\% > 35\%$

$\frac{9}{25} > 35\%$

d. $\frac{4}{5} \times \frac{20}{20} = \frac{80}{100} = 80\%$

$\frac{4}{5} = 80\%$

5. a. $\frac{2}{5} \times \frac{20}{20} = \frac{40}{100} = 40\%$

$35\% < 40\%$

Thursday

b. fraction answered correctly: $\frac{9}{10}$

percent answered correctly: $\frac{9}{10} \times \frac{10}{10} = \frac{90}{100} = 90\%$

percent answered incorrectly: $100\% - 90\% = 10\%$

c. $\frac{1}{4} \times \frac{25}{25} = \frac{25}{100} = 25\%$

$24\% < 25\%$

yellow flowers

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6. $\frac{3}{5} \times \frac{20}{20} = \frac{60}{100} = 60\%$

$\frac{7}{20} \times \frac{5}{5} = \frac{35}{100} = 35\%$

$\frac{4}{25} \times \frac{4}{4} = \frac{16}{100} = 16\%$

least to greatest: 16%, 25%, 35%, 55%, 60%, 82%

$\frac{4}{25}$, 25%, $\frac{7}{20}$, 55%, $\frac{3}{5}$, 82%

7. a. $\frac{4}{10} = \frac{2}{5}$

$\frac{2}{5} \times \frac{20}{20} = \frac{40}{100} = 40\%$

b. $\frac{3}{6} = \frac{1}{2}$

$\frac{1}{2} \times \frac{50}{50} = \frac{50}{100} = 50\%$

c. $\frac{22}{25}$

$\frac{22}{25} \times \frac{4}{4} = \frac{88}{100} = 88\%$

d. $\frac{4}{5}$

$\frac{4}{5} \times \frac{20}{20} = \frac{80}{100} = 80\%$

Review

1. a. $4\frac{8}{11}$

$\frac{11 \times 4 + 8}{11} = \frac{52}{11}$

b. $3\frac{3}{7}$

$\frac{7 \times 3 + 3}{7} = \frac{24}{7}$

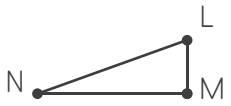
2. a. thousands place:
48,636.48509
round up
49,000

b. thousandths place:
48,636.48509
round down
48,636.485

3. a.



b.



4. a. fraction: $\frac{1}{4}$

percent: $\frac{1}{4} \times \frac{25}{25} = \frac{25}{100} = 25\%$

b. fraction: $\frac{1}{4}$

percent: $\frac{1}{4} \times \frac{25}{25} = \frac{25}{100} = 25\%$

c. fraction: $\frac{3}{4}$

percent: $\frac{3}{4} \times \frac{25}{25} = \frac{75}{100} = 75\%$

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ROUNDING FRACTIONS AND MIXED NUMBERS TO THE NEAREST WHOLE NUMBER

Video Lesson

blueberry cake:

Half of 11 is $5\frac{1}{2}$. 8 is more than $5\frac{1}{2}$.

$\frac{8}{11}$ is greater than $\frac{1}{2}$ ⟶ round up

$\frac{8}{11}$ ⟶ 1

strawberry cake:

Half of 14 is 7. 5 is less than 7.

$\frac{5}{14}$ is less than $\frac{1}{2}$ ⟶ round down

$5\frac{5}{14}$ ⟶ 5

chocolate cake:

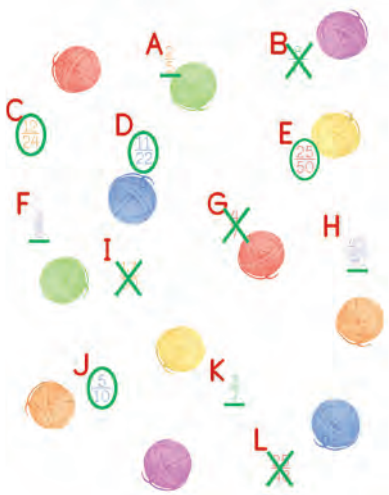
Half of 7 is $3\frac{1}{2}$. 5 is greater than $3\frac{1}{2}$.

$\frac{5}{7}$ is greater than $\frac{1}{2}$ ⟶ round up

$3\frac{5}{7}$ ⟶ 4

Practice

1. Work for each problem is shown below.



A $\frac{2}{5}$: Half of 5 is $2\frac{1}{2}$. 2 is less than $2\frac{1}{2}$.
$\frac{2}{5}$ is less than $\frac{1}{2}$.

B $\frac{8}{11}$: Half of 11 is $5\frac{1}{2}$. 8 is greater than $5\frac{1}{2}$.
$\frac{8}{11}$ is greater than $\frac{1}{2}$.

C $\frac{12}{24}$: Half of 24 is 12.
$\frac{12}{24}$ is equal to $\frac{1}{2}$.

D $\frac{11}{22}$: Half of 22 is 11.
$\frac{11}{22}$ is equal to $\frac{1}{2}$.

E $\frac{25}{50}$: Half of 50 is 25.
$\frac{25}{50}$ is equal to $\frac{1}{2}$.

F $\frac{3}{8}$: Half of 8 is 4. 3 is less than 4.
$\frac{3}{8}$ is less than $\frac{1}{2}$.

G $\frac{4}{7}$: Half of 7 is $3\frac{1}{2}$. 4 is greater than $3\frac{1}{2}$.
$\frac{4}{7}$ is greater than $\frac{1}{2}$.

H $\frac{43}{90}$: Half of 90 is 45. 43 is less than 45.
$\frac{43}{90}$ is less than $\frac{1}{2}$.

I $\frac{17}{30}$: Half of 30 is 15. 17 is greater than 15.
$\frac{17}{30}$ is greater than $\frac{1}{2}$.

J $\frac{5}{10}$: Half of 10 is 5.
$\frac{5}{10}$ is equal to $\frac{1}{2}$.

K $\frac{3}{7}$: Half of 7 is $3\frac{1}{2}$. 3 is less than $3\frac{1}{2}$.
$\frac{3}{7}$ is less than $\frac{1}{2}$.

L $\frac{25}{48}$: Half of 48 is 24. 25 is greater than 24.
$\frac{25}{48}$ is greater than $\frac{1}{2}$.

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2. a. Half of 7 is $3\frac{1}{2}$. 2 is less than $3\frac{1}{2}$.

$\frac{2}{7}$ is less than $\frac{1}{2}$ ⟶ round down

$\frac{2}{7}$ ⟶ 0

b. Half of 16 is 8.

$\frac{8}{16}$ is equal to $\frac{1}{2}$ ⟶ round up

$\frac{8}{16}$ ⟶ 1

c. Half of 11 is $5\frac{1}{2}$. 7 is greater than $5\frac{1}{2}$.

$\frac{7}{11}$ is greater than $\frac{1}{2}$ ⟶ round up

$\frac{7}{11}$ ⟶ 1

d. Half of 8 is 4. 5 is greater than 4.

$\frac{5}{8}$ is greater than $\frac{1}{2}$ ⟶ round up

$\frac{5}{8}$ ⟶ 1

3. a. Half of 5 is $2\frac{1}{2}$. 4 is greater than $2\frac{1}{2}$.

$\frac{4}{5}$ is greater than $\frac{1}{2}$ ⟶ round up

$1\frac{4}{5}$ ⟶ 2

b. Half of 5 is $2\frac{1}{2}$. 2 is less than $2\frac{1}{2}$.

$\frac{2}{5}$ is less than $\frac{1}{2}$ ⟶ round down

$4\frac{2}{5}$ ⟶ 4

c. Half of 7 is $3\frac{1}{2}$. 3 is less than $3\frac{1}{2}$.

$\frac{3}{7}$ is less than $\frac{1}{2}$ ⟶ round down

$2\frac{3}{7}$ ⟶ 2

d. Half of 11 is $5\frac{1}{2}$. 6 is greater than $5\frac{1}{2}$.

$\frac{6}{11}$ is greater than $\frac{1}{2}$ ⟶ round up

$6\frac{6}{11}$ ⟶ 7

4. a. $\frac{7}{2} = 3\frac{1}{2}$

$\frac{1}{2}$ ⟶ round up

$3\frac{1}{2}$ ⟶ 4

b. $\frac{12}{5} = 2\frac{2}{5}$

Half of 5 is $2\frac{1}{2}$. 2 is less than $2\frac{1}{2}$.

$\frac{2}{5}$ is less than $\frac{1}{2}$ ⟶ round down

$2\frac{2}{5}$ ⟶ 2

c. $\frac{29}{7} = 4\frac{1}{7}$

Half of 7 is $3\frac{1}{2}$. 1 is less than $3\frac{1}{2}$.

$\frac{1}{7}$ is less than $\frac{1}{2}$ ⟶ round down

$4\frac{1}{7}$ ⟶ 4

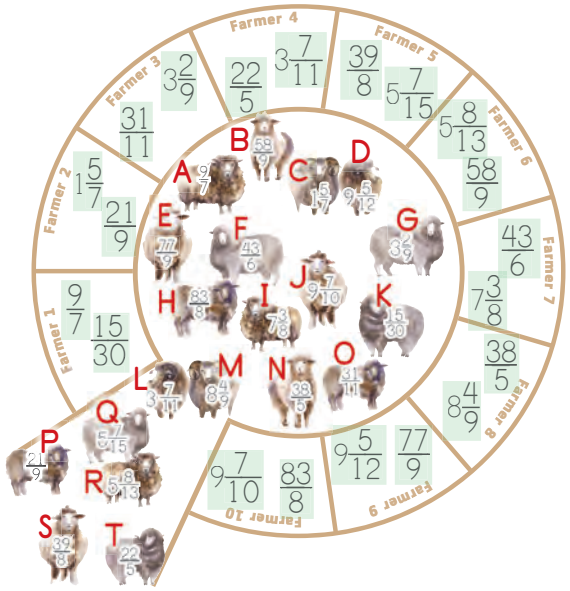
d. $\frac{21}{4} = 5\frac{1}{4}$

Half of 4 is 2. 1 is less than 2.

$\frac{1}{4}$ is less than $\frac{1}{2}$ ⟶ round down

$5\frac{1}{4}$ ⟶ 5

5. Work for each problem is shown on the next page..



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A $\frac{9}{7} = 1\frac{2}{7}$

$\frac{2}{7}$: Half of 7 is $3\frac{1}{2}$. 2 is less than $3\frac{1}{2}$.

$\frac{2}{7}$ is less than $\frac{1}{2} \longrightarrow$ round down

$1\frac{2}{7} \longrightarrow 1$

B $\frac{58}{9} = 6\frac{4}{9}$

$\frac{4}{9}$: Half of 9 is $4\frac{1}{2}$. 4 is less than $4\frac{1}{2}$.

$\frac{4}{9}$ is less than $\frac{1}{2} \longrightarrow$ round down

$6\frac{4}{9} \longrightarrow 6$

C $\frac{5}{7}$: Half of 7 is $3\frac{1}{2}$. 5 is greater than $3\frac{1}{2}$.

$\frac{5}{7}$ is greater than $\frac{1}{2} \longrightarrow$ round up

$1\frac{5}{7} \longrightarrow 2$

D $\frac{5}{12}$: Half of 12 is 6. 5 is less than 6.

$\frac{5}{12}$ is less than $\frac{1}{2} \longrightarrow$ round down

$9\frac{5}{12} \longrightarrow 9$

E $\frac{77}{9} = 8\frac{5}{9}$

$\frac{5}{9}$: Half of 9 is $4\frac{1}{2}$. 5 is greater than $4\frac{1}{2}$.

$\frac{5}{9}$ is greater than $\frac{1}{2} \longrightarrow$ round up

$8\frac{5}{9} \longrightarrow 9$

F $\frac{43}{6} = 7\frac{1}{6}$

$\frac{1}{6}$: Half of 6 is 3. 1 is less than 3.

$\frac{1}{6}$ is less than $\frac{1}{2} \longrightarrow$ round down

$7\frac{1}{6} \longrightarrow 7$

G $\frac{2}{9}$: Half of 9 is $4\frac{1}{2}$. 2 is less than $4\frac{1}{2}$.

$\frac{2}{9}$ is less than $\frac{1}{2} \longrightarrow$ round down

$3\frac{2}{9} \longrightarrow 3$

H $\frac{83}{8} = 10\frac{3}{8}$

$\frac{3}{8}$: Half of 8 is 4. 3 is less than 4.

$\frac{3}{8}$ is less than $\frac{1}{2} \longrightarrow$ round down

$10\frac{3}{8} \longrightarrow 10$

I $\frac{3}{8}$: Half of 8 is 4. 3 is less than 4.

$\frac{3}{8}$ is less than $\frac{1}{2} \longrightarrow$ round down

$7\frac{3}{8} \longrightarrow 7$

J $\frac{7}{10}$: Half of 10 is 5. 7 is greater than 5.

$\frac{7}{10}$ is greater than $\frac{1}{2} \longrightarrow$ round up

$9\frac{7}{10} \longrightarrow 10$

K $\frac{15}{30}$: Half of 30 is 15.

$\frac{15}{30}$ is equal to $\frac{1}{2} \longrightarrow$ round up

$\frac{15}{30} \longrightarrow 1$

L $\frac{7}{11}$: Half of 11 is $5\frac{1}{2}$. 7 is greater than $5\frac{1}{2}$.

$\frac{7}{11}$ is greater than $\frac{1}{2} \longrightarrow$ round up

$3\frac{7}{11} \longrightarrow 4$

M $\frac{4}{9}$: Half of 9 is $4\frac{1}{2}$. 4 is less than $4\frac{1}{2}$.

$\frac{4}{9}$ is less than $\frac{1}{2} \longrightarrow$ round down

$8\frac{4}{9} \longrightarrow 8$

N $\frac{38}{5} \longrightarrow 7\frac{3}{5}$

$\frac{3}{5}$: Half of 5 is $2\frac{1}{2}$. 3 is greater than $2\frac{1}{2}$.

$\frac{3}{5}$ is greater than $\frac{1}{2} \longrightarrow$ round up

$7\frac{3}{5} \longrightarrow 8$

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O $\frac{31}{11} = 2\frac{9}{11}$

$\frac{9}{11}$: Half of 11 is $5\frac{1}{2}$. 9 is greater than $5\frac{1}{2}$.

$\frac{9}{11}$ is greater than $\frac{1}{2} \longrightarrow$ round up

$2\frac{9}{11} \longrightarrow 3$

P $\frac{21}{9} \longrightarrow 2\frac{3}{9} = 2\frac{1}{3}$

$\frac{1}{3}$: Half of 3 is $1\frac{1}{2}$. 1 is less than $1\frac{1}{2}$.

$\frac{1}{3}$ is less than $\frac{1}{2} \longrightarrow$ round down

$2\frac{1}{3} \longrightarrow 2$

Q $\frac{7}{15}$: Half of 15 is $7\frac{1}{2}$. 7 is less than $7\frac{1}{2}$.

$\frac{7}{15}$ is less than $\frac{1}{2} \longrightarrow$ round down

$5\frac{7}{15} \longrightarrow 5$

R $\frac{8}{13}$: Half of 13 is $6\frac{1}{2}$. 8 is greater than $6\frac{1}{2}$.

$\frac{8}{13}$ is greater than $\frac{1}{2} \longrightarrow$ round up

$5\frac{8}{13} \longrightarrow 6$

S $\frac{39}{8} = 4\frac{7}{8}$

$\frac{7}{8}$: Half of 8 is 4. 7 is greater than 4.

$\frac{7}{8}$ is greater than $\frac{1}{2} \longrightarrow$ round up

$4\frac{7}{8} \longrightarrow 5$

T $\frac{22}{5} = 4\frac{2}{5}$

$\frac{2}{5}$: Half of 5 is $2\frac{1}{2}$. 2 is less than $2\frac{1}{2}$.

$\frac{2}{5}$ is less than $\frac{1}{2} \longrightarrow$ round down

$4\frac{2}{5} \longrightarrow 4$

Review

1. a. $\frac{4}{5} \times \frac{20}{20} = \frac{80}{100} = 80\%$

b. $\frac{7}{50} \times \frac{2}{2} = \frac{14}{100} = 14\%$

2. a. $95\% = \frac{95}{100} = \frac{19}{20}$

b. $20\% = \frac{20}{100} = \frac{1}{5}$

3. a. $\frac{1}{10} + \frac{2}{5} + \frac{2}{15}$

LCM of 10, 5, and 15: 30

$\frac{1}{10} \times \frac{3}{3} + \frac{2}{5} \times \frac{6}{6} + \frac{2}{15} \times \frac{2}{2}$

$= \frac{3}{30} + \frac{12}{30} + \frac{4}{30}$

$= \frac{19}{30}$

b. $\frac{6}{7} - \frac{2}{3}$

LCM of 7 and 3: 21

$\frac{6}{7} \times \frac{3}{3} - \frac{2}{3} \times \frac{7}{7}$

$= \frac{18}{21} - \frac{14}{21}$

$= \frac{4}{21}$

4. a. $3.4 = 3\frac{4}{10} = 3\frac{2}{5}$

b. $10.85 = 10\frac{85}{100} = 10\frac{17}{20}$

5. a. factors of 10: 1, 2, 5, 10

b. factors of 15: 1, 3, 5, 15

c. factors of 30: 1, 2, 3, 5, 6, 10, 15, 30

GCF of 10, 15, 30: 5

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MULTIPLYING FRACTIONS BY WHOLE NUMBERS

Video Lesson

$\frac{2}{5}$ is less than $\frac{1}{2}$, so the answer will be less than $\frac{1}{2} \times 8$, which is 4.

$\frac{2}{5}$ is more than 0, so the answer will be more than 0×8, which is 0.

Reasonable answer: between 0 and 4

$\frac{2}{5} \times \frac{8}{1} = \frac{16}{5} = 3\frac{1}{5}$

Practice

1. a. (given)

b. $5 \times \frac{2}{5} = \frac{2}{5} + \frac{2}{5} + \frac{2}{5} + \frac{2}{5} + \frac{2}{5} = \frac{10}{5} = 2$

c. $4 \times \frac{1}{9} = \frac{1}{9} + \frac{1}{9} + \frac{1}{9} + \frac{1}{9} = \frac{4}{9}$

d. $2 \times \frac{3}{2} = \frac{3}{2} + \frac{3}{2} = \frac{6}{2} = 3$

2. a. $7 \times \frac{2}{3} = \frac{7}{1} \times \frac{2}{3} = \frac{14}{3} = 4\frac{2}{3}$

b. $\frac{7}{10} \times 4 = \frac{7}{10} \times \frac{4}{1} = \frac{28}{10} = 2\frac{8}{10} = 2\frac{4}{5}$

c. $12 \times \frac{5}{6} = \frac{12}{1} \times \frac{5}{6} = \frac{60}{6} = 10$

d. $\frac{2}{3} \times 9 = \frac{2}{3} \times \frac{9}{1} = \frac{18}{3} = 6$

3. a. $\frac{3}{4} \times 4 = \frac{3}{4} \times \frac{4}{1} = \frac{12}{4} = 3$

3 miles

b. $\frac{2}{3} \times 3 = \frac{2}{3} \times \frac{3}{1} = \frac{6}{3} = 2$

2 cups of raspberries

c. $\frac{1}{3} \times 453 = \frac{1}{3} \times \frac{453}{1} = \frac{453}{3} = 151$

151 miles

453 - 151 = 302

302 miles

4. a. $\frac{2}{3} \times 24 = \frac{2}{3} \times \frac{24}{1} = \frac{48}{3} = 16$

b. $\frac{4}{5} \times 5 = \frac{4}{5} \times \frac{5}{1} = \frac{20}{5} = 4$

$\frac{4}{5} \times 15 = \frac{4}{5} \times \frac{15}{1} = \frac{60}{5} = 12$

c. $\frac{3}{8} \times 6 = \frac{3}{8} \times \frac{6}{1} = \frac{18}{8} = 2\frac{2}{8} = 2\frac{1}{4}$

$\frac{3}{8} \times 80 = \frac{3}{8} \times \frac{80}{1} = \frac{240}{8} = 30$

d. $\frac{5}{6} \times 3 = \frac{5}{6} \times \frac{3}{1} = \frac{15}{6} = 2\frac{3}{6} = 2\frac{1}{2}$

$\frac{5}{6} \times 10 = \frac{5}{6} \times \frac{10}{1} = \frac{50}{6} = 8\frac{2}{6} = 8\frac{1}{3}$

5. a. $\frac{3}{5} \times 5 = \frac{3}{5} \times \frac{5}{1} = \frac{15}{5} = 3$

$4 \times \frac{5}{8} = \frac{4}{1} \times \frac{5}{8} = \frac{20}{8} = 2\frac{4}{8} = 2\frac{1}{2}$

$3 > 2\frac{1}{2}$

$\frac{3}{5} \times 5 > 4 \times \frac{5}{8}$

b. $3 \times \frac{3}{10} = \frac{3}{1} \times \frac{3}{10} = \frac{9}{10}$

$\frac{1}{10} \times 6 = \frac{1}{10} \times \frac{6}{1} = \frac{6}{10}$

$\frac{9}{10} > \frac{6}{10}$

$3 \times \frac{3}{10} > \frac{1}{10} \times 6$

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Review

1. a. Half of 15 is $7\frac{1}{2}$. 8 is greater than $7\frac{1}{2}$.

$\frac{8}{15}$ is greater than $\frac{1}{2}$ $\longrightarrow$ round up

$7\frac{8}{15} \longrightarrow 8$

b. $\frac{9}{2} = 4\frac{1}{2}$

$\frac{1}{2} \longrightarrow$ round up

$4\frac{1}{2} \longrightarrow 5$

2. a. $35\% = \frac{35}{100} = \frac{7}{20}$

b. $60\% = \frac{60}{100} = \frac{3}{5}$

3. perimeter = 24 m + 26 m + 10 m = 60 m

area = $\frac{10 \text{ m} \times 24 \text{ m}}{2} = \frac{240 \text{ m}^2}{2} = 120 \text{ m}^2$

4.
$$\begin{array}{r} {\scriptstyle 1\ 1\ 1} \\ \$433.87 \\ \$23.84 \\ +\ \$114.05 \\ \hline \$571.76 \end{array}$$

5. a. 8

b. 0

c. 4

6. factors: 1, 2, 4, 8, 16, 32, 64

factor pairs: 1 and 64, 2 and 32, 4 and 16, 8 and 8

7. a. $14^2 = 14 \times 14 = 196$

b. $11^2 = 11 \times 11 = 121$

c. $\sqrt{225} = 15$

d. $\sqrt{196} = 14$

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CANCELING BEFORE MULTIPLYING FRACTIONS

Video Lesson

Top Box

$$\frac{\cancel{1}}{\cancel{8}_{4}} \times \frac{\cancel{1}}{\cancel{15}_{5}} = \frac{1}{20}$$

Bottom Box

$$\frac{\cancel{2}_{1}}{\cancel{4}_{2}} \times \frac{\cancel{2}_{1}}{\cancel{3}_{1}} \times \frac{\cancel{15}^{1}}{\cancel{22}_{11}} = \frac{4}{11}$$

Practice

1. Work for each problem on the path is shown below.



1 $\frac{\cancel{2}^{1}}{3} \times \frac{1}{\cancel{2}_{1}} = \frac{1}{3}$

2 $\frac{\cancel{4}^{1}}{\cancel{8}_{1}} \times \frac{1}{\cancel{3}_{1}} = \frac{1}{4}$

3 $\frac{1}{\cancel{2}_{1}} \times \frac{\cancel{2}^{1}}{5} = \frac{1}{5}$

4 $\frac{1}{\cancel{6}_{2}} \times \frac{\cancel{3}^{1}}{4} = \frac{1}{8}$

5 $\frac{1}{\cancel{2}_{1}} \times \frac{\cancel{4}^{1}}{\cancel{4}_{2}} = \frac{1}{6}$

6 $\frac{\cancel{4}^{2}}{5} \times \frac{1}{\cancel{2}_{1}} = \frac{2}{5}$

7 $\frac{\cancel{7}^{1}}{8} \times \frac{1}{\cancel{7}_{1}} = \frac{1}{8}$

8 $\frac{\cancel{3}^{1}}{8} \times \frac{1}{\cancel{9}_{3}} = \frac{1}{24}$

9 $\frac{\cancel{2}^{1}}{\cancel{3}_{1}} \times \frac{\cancel{6}^{2}}{7} = \frac{4}{7}$

10 $\frac{\cancel{3}^{1}}{5} \times \frac{2}{\cancel{3}_{1}} = \frac{2}{5}$

11 $\frac{\cancel{4}^{2}}{7} \times \frac{1}{\cancel{2}_{1}} = \frac{2}{7}$

12 $\frac{\cancel{2}^{1}}{5} \times \frac{3}{\cancel{4}_{2}} = \frac{3}{10}$

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13 $\frac{\cancel{3}^{1}}{\cancel{8}_{2}} \times \frac{1}{\cancel{4}^{1}_{5}} = \frac{3}{10}$

14 $\frac{1}{\cancel{3}^{1}_{7}} \times \frac{\cancel{2}^{1}}{\cancel{9}_{3}} = \frac{2}{21}$

15 $\frac{\cancel{5}^{1}}{8} \times \frac{1}{\cancel{5}^{1}} = \frac{1}{8}$

16 $\frac{\cancel{3}^{1}}{\cancel{4}_{2}} \times \frac{1}{\cancel{2}^{1}_{7}} = \frac{3}{14}$

17 $\frac{\cancel{2}^{1}}{\cancel{5}_{1}} \times \frac{1}{\cancel{5}^{1}_{7}} = \frac{2}{7}$

18 $\frac{\cancel{3}^{1}}{\cancel{8}_{1}} \times \frac{\cancel{8}^{1}}{\cancel{9}_{3}} = \frac{1}{3}$

19 $\frac{\cancel{4}^{1}}{\cancel{5}_{1}} \times \frac{\cancel{5}^{1}}{\cancel{8}_{2}} = \frac{1}{2}$

20 $\frac{\cancel{7}^{1}}{\cancel{12}_{2}} \times \frac{\cancel{6}^{1}}{\cancel{7}_{1}} = \frac{1}{2}$

21 $\frac{\cancel{5}^{1}}{\cancel{9}_{1}} \times \frac{\cancel{9}^{1}}{\cancel{10}_{2}} = \frac{1}{2}$

22 $\frac{\cancel{4}^{1}}{\cancel{7}_{1}} \times \frac{\cancel{7}^{1}}{\cancel{12}_{3}} = \frac{1}{3}$

23 $\frac{\cancel{5}^{1}}{\cancel{6}_{1}} \times \frac{\cancel{6}^{1}}{\cancel{25}_{5}} = \frac{1}{5}$

24 $\frac{\cancel{2}^{1}}{\cancel{9}_{3}} \times \frac{\cancel{3}^{1}}{\cancel{8}_{4}} = \frac{1}{12}$

25 $\frac{\cancel{4}^{1}}{\cancel{9}_{3}} \times \frac{\cancel{3}^{1}}{\cancel{4}_{1}} = \frac{1}{3}$

26 $\frac{\cancel{3}^{3}}{\cancel{7}_{1}} \times \frac{1}{\cancel{7}^{1}_{10}} = \frac{3}{5}$

27 $\frac{\cancel{5}^{1}}{\cancel{6}_{3}} \times \frac{\cancel{4}^{2}}{\cancel{5}_{1}} = \frac{2}{3}$

28 $\frac{1}{\cancel{7}^{1}_{10}} \times \frac{\cancel{5}^{1}}{\cancel{7}_{1}} = \frac{1}{2}$

29 $\frac{\cancel{3}^{1}}{\cancel{4}_{2}} \times \frac{\cancel{2}^{1}}{\cancel{9}_{3}} = \frac{1}{6}$

30 $\frac{\cancel{3}^{1}}{\cancel{10}_{2}} \times \frac{\cancel{5}^{1}}{\cancel{6}_{2}} = \frac{1}{4}$

31 $\frac{\cancel{9}^{3}}{\cancel{10}_{5}} \times \frac{\cancel{2}^{1}}{\cancel{3}_{1}} = \frac{3}{5}$

32 $\frac{\cancel{3}^{1}}{\cancel{4}_{1}} \times \frac{\cancel{8}^{2}}{\cancel{9}_{3}} = \frac{2}{3}$

33 $\frac{\cancel{7}^{1}}{\cancel{9}_{3}} \times \frac{\cancel{3}^{1}}{\cancel{14}_{2}} = \frac{1}{6}$

34 $\frac{\cancel{4}^{1}}{\cancel{5}_{1}} \times \frac{\cancel{15}^{3}}{\cancel{16}_{4}} = \frac{3}{4}$

35 $\frac{\cancel{3}^{1}}{\cancel{4}_{1}} \times \frac{\cancel{8}^{2}}{\cancel{15}_{5}} = \frac{2}{5}$

36 $\frac{\cancel{15}^{1}}{\cancel{16}_{2}} \times \frac{\cancel{8}^{1}}{\cancel{15}_{1}} = \frac{1}{2}$

37 $\frac{\cancel{4}^{1}}{\cancel{15}_{5}} \times \frac{\cancel{3}^{1}}{\cancel{20}_{5}} = \frac{1}{25}$

38 $\frac{\cancel{2}^{1}}{\cancel{45}_{5}} \times \frac{\cancel{9}^{1}}{\cancel{20}_{10}} = \frac{1}{50}$

39 $\frac{\cancel{5}^{1}}{\cancel{36}_{12}} \times \frac{\cancel{3}^{1}}{\cancel{5}_{1}} = \frac{1}{12}$

40 $\frac{\cancel{7}^{1}}{\cancel{33}_{3}} \times \frac{\cancel{11}^{1}}{\cancel{14}_{2}} = \frac{1}{6}$

41 $\frac{\cancel{15}^{3}}{\cancel{22}_{11}} \times \frac{\cancel{4}^{2}}{\cancel{25}_{5}} = \frac{6}{55}$

42 $\frac{\cancel{5}^{1}}{\cancel{18}_{2}} \times \frac{\cancel{9}^{1}}{\cancel{50}_{10}} = \frac{1}{20}$

43 $\frac{\cancel{9}^{1}}{\cancel{28}_{2}} \times \frac{\cancel{14}^{1}}{\cancel{27}_{3}} = \frac{1}{6}$

44 $\frac{\cancel{11}^{1}}{\cancel{15}_{3}} \times \frac{\cancel{35}^{7}}{\cancel{44}_{4}} = \frac{7}{12}$

45 $\frac{\cancel{9}^{1}}{\cancel{13}_{1}} \times \frac{\cancel{26}^{2}}{\cancel{81}_{9}} = \frac{2}{9}$

46 $\frac{\cancel{7}^{1}}{\cancel{15}_{3}} \times \frac{\cancel{20}^{4}}{\cancel{21}_{3}} = \frac{4}{9}$

47 $\frac{\cancel{8}^{1}}{\cancel{45}_{5}} \times \frac{\cancel{9}^{1}}{\cancel{16}_{2}} = \frac{1}{10}$

48 $\frac{\cancel{16}^{1}}{\cancel{25}_{5}} \times \frac{\cancel{15}^{3}}{\cancel{32}_{2}} = \frac{3}{10}$

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2. a. $\frac{\cancel{2}^{1}}{\cancel{3}_{1}} \times \frac{\cancel{3}^{1}}{5} \times \frac{1}{\cancel{4}_{2}} = \frac{1}{10}$

b. $\frac{\cancel{2}^{1}}{5} \times \frac{\cancel{3}^{1}}{\cancel{14}_{\cancel{2}_{1}}} \times \frac{\cancel{7}^{1}}{\cancel{9}_{3}} = \frac{1}{15}$

c. $\frac{\cancel{5}^{1}}{\cancel{8}_{2}} \times \frac{\cancel{4}^{1}}{\cancel{15}_{\cancel{3}_{1}}} \times \frac{\cancel{2}^{1}}{2} = \frac{1}{4}$

d. $\frac{\cancel{9}^{1}}{\cancel{15}_{\cancel{3}_{1}}} \times \frac{\cancel{6}^{2}}{5} \times \frac{\cancel{5}^{1}}{\cancel{9}_{1}} = \frac{2}{5}$

e. $\frac{\cancel{5}^{1}}{\cancel{9}_{1}} \times \frac{\cancel{5}^{1}}{\cancel{7}_{1}} \times \frac{\cancel{9}^{1}}{\cancel{25}_{\cancel{5}_{1}}} \times \frac{1}{7} = \frac{1}{9}$

Review

1. a. $8 \times \frac{1}{4} = \frac{8}{1} \times \frac{1}{4} = \frac{8}{4} = 2$

b. $\frac{6}{5} \times 10 = \frac{6}{5} \times \frac{10}{1} = \frac{60}{5} = 12$

2. a. 6

b. 5

3. a. $A = L \times W$

b. $A = \frac{bh}{2}$

4. a. Half of 10 is 5. 7 is greater than 5.

$\frac{7}{10}$ is greater than $\frac{1}{2} \longrightarrow$ round up

$\frac{7}{10} \longrightarrow 1$

b. Half of 12 is 6. 5 is less than 6.

$\frac{5}{12}$ is less than $\frac{1}{2} \longrightarrow$ round down

$4\frac{5}{12} \longrightarrow 4$

c. 53(5)

round up

54

5. a. Multiplication facts:

$12 \times 12 = 144$

B = 12

b. Multiplication facts:

$15 \times 15 = 225$

K = 15

6. a. $\frac{5}{6} + \frac{3}{4}$

$= \frac{10}{12} + \frac{9}{12}$

$= \frac{19}{12}$

$= 1\frac{7}{12}$

b. $9 - 5\frac{2}{3}$

$= 8\frac{3}{3} - 5\frac{2}{3}$

$= 3\frac{1}{3}$

SURFACE AREA OF GEOMETRIC SOLIDS

Video Lesson

Top Left Box

area of one square: $5 \text{ in} \times 5 \text{ in} = 25 \text{ in}^2$

surface area: $25 \text{ in}^2 + 25 \text{ in}^2 + 25 \text{ in}^2 + 25 \text{ in}^2 + 25 \text{ in}^2 + 25 \text{ in}^2 = 150 \text{ in}^2$

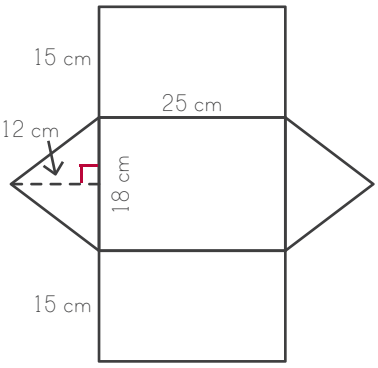
Top Right Box

square area: $6 \text{ in} \times 6 \text{ in} = 36 \text{ in}^2$

triangle area: $\frac{6 \text{ in} \times 14 \text{ in}}{2} = \frac{84 \text{ in}^2}{2} = 42 \text{ in}^2$

surface area: $36 \text{ in}^2 + 42 \text{ in}^2 + 42 \text{ in}^2 + 42 \text{ in}^2 + 42 \text{ in}^2 = 204 \text{ in}^2$

Bottom Box



area of rectangle face 1: $15 \text{ cm} \times 25 \text{ cm} = 375 \text{ cm}^2$
area of rectangle face 2: $18 \text{ cm} \times 25 \text{ cm} = 450 \text{ cm}^2$
area of rectangle face 3: $15 \text{ cm} \times 25 \text{ cm} = 375 \text{ cm}^2$
area of triangle face 1: $\frac{18 \text{ cm} \times 12 \text{ cm}}{2} = \frac{216 \text{ cm}^2}{2} = 108 \text{ cm}^2$
area of triangle face 2: $\frac{18 \text{ cm} \times 12 \text{ cm}}{2} = \frac{216 \text{ cm}^2}{2} = 108 \text{ cm}^2$

surface area of the triangular prism:
$375 \text{ cm}^2 + 450 \text{ cm}^2 + 375 \text{ cm}^2 + 108 \text{ cm}^2 + 108 \text{ cm}^2 = 1{,}416 \text{ cm}^2$

Practice

1. a. area of square face 1: $8 \text{ cm} \times 8 \text{ cm} = 64 \text{ cm}^2$
area of square face 2: $8 \text{ cm} \times 8 \text{ cm} = 64 \text{ cm}^2$
area of square face 3: $8 \text{ cm} \times 8 \text{ cm} = 64 \text{ cm}^2$
area of square face 4: $8 \text{ cm} \times 8 \text{ cm} = 64 \text{ cm}^2$
area of square face 5: $8 \text{ cm} \times 8 \text{ cm} = 64 \text{ cm}^2$
area of square face 6: $8 \text{ cm} \times 8 \text{ cm} = 64 \text{ cm}^2$

surface area of the cube: $64 \text{ cm}^2 + 64 \text{ cm}^2 + 64 \text{ cm}^2 + 64 \text{ cm}^2 + 64 \text{ cm}^2 + 64 \text{ cm}^2 = 384 \text{ cm}^2$

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b. area of rectangle face 1: 5 cm × 8 cm = $40\ cm^2$
area of rectangle face 2: 6 cm × 8 cm = $48\ cm^2$
area of rectangle face 3: 5 cm × 8 cm = $40\ cm^2$
area of triangle face 1: $\frac{6\ cm \times 4\ cm}{2} = \frac{24\ cm^2}{2} = 12\ cm^2$
area of triangle face 2: $\frac{6\ cm \times 4\ cm}{2} = \frac{24\ cm^2}{2} = 12\ cm^2$

surface area of the triangular prism: $40\ cm^2 + 48\ cm^2 + 40\ cm^2 + 12\ cm^2 + 12\ cm^2 = 152\ cm^2$

2. a. area of top square: 7 ft × 7 ft = $49\ ft^2$
area of bottom square: 7 ft × 7 ft = $49\ ft^2$
area of front rectangle: 7 ft × 12 ft = $84\ ft^2$
area of back rectangle: 7 ft × 12 ft = $84\ ft^2$
area of side rectangle 1: 7 ft × 12 ft = $84\ ft^2$
area of side rectangle 2: 7 ft × 12 ft = $84\ ft^2$

surface area of the rectangular prism: $49\ ft^2 + 49\ ft^2 + 84\ ft^2 + 84\ ft^2 + 84\ ft^2 + 84\ ft^2 = 434\ ft^2$

b. area of bottom square: 6 km × 6 km = $36\ km^2$
area of triangle 1: $\frac{6\ km \times 9\ km}{2} = \frac{54\ km^2}{2} = 27\ km^2$
area of triangle 2: $\frac{6\ km \times 9\ km}{2} = \frac{54\ km^2}{2} = 27\ km^2$
area of triangle 3: $\frac{6\ km \times 9\ km}{2} = \frac{54\ km^2}{2} = 27\ km^2$
area of triangle 4: $\frac{6\ km \times 9\ km}{2} = \frac{54\ km^2}{2} = 27\ km^2$

surface area of the square pyramid: $36\ km^2 + 27\ km^2 + 27\ km^2 + 27\ km^2 + 27\ km^2 = 144\ km^2$

3. a. area of bottom rectangle: 12 m × 7 m = $84\ m^2$
area of back rectangle: 16 m × 7 m = $112\ m^2$
area of front (slanted) rectangle: 20 m × 7 m = $140\ m^2$
area of front triangle: $\frac{12\ m \times 16\ m}{2} = \frac{192\ m^2}{2} = 96\ m^2$
area of back triangle: $\frac{12\ m \times 16\ m}{2} = \frac{192\ m^2}{2} = 96\ m^2$

surface area of the triangular prism: $84\ m^2 + 112\ m^2 + 140\ m^2 + 96\ m^2 + 96\ m^2 = 528\ m^2$

b. area of square face 1: 9 yd × 9 yd = 81 yd^2
area of square face 2: 9 yd × 9 yd = 81 yd^2
area of square face 3: 9 yd × 9 yd = 81 yd^2
area of square face 4: 9 yd × 9 yd = 81 yd^2
area of square face 5: 9 yd × 9 yd = 81 yd^2
area of square face 6: 9 yd × 9 yd = 81 yd^2

surface area of the cube: 81 yd^2 + 81 yd^2 + 81 yd^2 + 81 yd^2 + 81 yd^2 + 81 yd^2 = 486 yd^2

Review

1. $\frac{\cancel{3}^{1}}{8} \times \frac{\cancel{7}^{1}}{\cancel{15}_{\cancel{5}_{1}}} \times \frac{\cancel{5}^{1}}{\cancel{21}_{3}} = \frac{1}{24}$

2.

Fraction	Percent
$\frac{1}{10}$	$\frac{1}{10} \times \frac{10}{10} = \frac{10}{100} = 10\%$
$5\% = \frac{5}{100} = \frac{1}{20}$	5%
$\frac{9}{20}$	$\frac{9}{20} \times \frac{5}{5} = \frac{45}{100} = 45\%$

3. Compare the hundredths place:
0.4056
0.406
0.4502 ⟵ greatest

Compare the thousandths place:
0.4056 ⟵ least
0.406

Greatest to least: 0.4502, 0.406, 0.4056

4. green: (-7, 3)
blue: (-5, -4)
purple: (0, -7)
orange: (2, 6)
yellow: (6, 0)

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RATIOS

Video Lesson

ratio of men to women:
15 : 10
divide both terms by 5
3 : 2

ratio of men to people:
15 to 25
divide both terms by 5
3 to 5

Practice

1.

	Ratio with a Colon	Ratio as a Fraction	Ratio with the Word "to"
two to nine	2 : 9	$\frac{2}{9}$	2 to 9
four to eleven	4 : 11	$\frac{4}{11}$	4 to 11
ten to seven	10 : 7	$\frac{10}{7}$	10 to 7

2. a. 24 : 30
divide both terms by 6
4 : 5

b. 16 : 40
divide both terms by 8
2 : 5

c. 33 : 88
divide both terms by 11
3 : 8

d. 10 : 18
divide both terms by 2
5 : 9

e. 63 : 27
divide both terms by 9
7 : 3

f. 75 : 100
divide both terms by 25
3 : 4

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3. a. $5:3, \frac{5}{3}$

b. $2:4$
divide both terms by 2
$1:2, \frac{1}{2}$

c. $4:5, \frac{4}{5}$

d. $2:6$
divide both terms by 2
$1:3, \frac{1}{3}$

e. $3:6$
divide both terms by 3
$1:2, \frac{1}{2}$

f. $1:3, \frac{1}{3}$

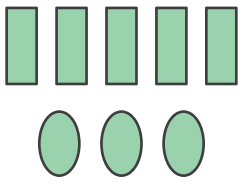
g. $5:2, \frac{5}{2}$

h. $3:6$
divide both terms by 3
$1:2, \frac{1}{2}$

i. $3:7, \frac{3}{7}$

j. $5:11, \frac{5}{11}$

4. a. (given)

b. 

c. 

5. a. $5:9, \frac{5}{9}$

b. $9:5, \frac{9}{5}$

c. $14:5, \frac{14}{5}$

6. a. $42:18$
divide both terms by 6
$7:3$

$42:18 \neq \frac{3}{7}$

b. $15:45$
divide both terms by 15
$1:3$

$15:45 \neq 3$ to 5

c. $\frac{77}{22}$
divide both terms by 11
$\frac{7}{2}$

$\frac{77}{22} = 7$ to 2

d. $16:18$
divide both terms by 2
$8:9$

$16:18 \neq \frac{9}{8}$

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Review

1. area of bottom rectangle: $10 \text{ cm} \times 3 \text{ cm} = 30 \text{ cm}^2$
area of back rectangle: $10 \text{ cm} \times 4 \text{ cm} = 40 \text{ cm}^2$
area of front (slanted) rectangle: $10 \text{ cm} \times 5 \text{ cm} = 50 \text{ cm}^2$
area of front triangle: $\frac{3 \text{ cm} \times 4 \text{ cm}}{2} = \frac{12 \text{ cm}^2}{2} = 6 \text{ cm}^2$
area of back triangle: $\frac{3 \text{ cm} \times 4 \text{ cm}}{2} = \frac{12 \text{ cm}^2}{2} = 6 \text{ cm}^2$

surface area of the triangular prism: $30 \text{ cm}^2 + 40 \text{ cm}^2 + 50 \text{ cm}^2 + 6 \text{ cm}^2 + 6 \text{ cm}^2 = 132 \text{ cm}^2$

2. $\frac{\cancel{4}^{1}}{\cancel{7}_{1}} \times \frac{\cancel{3}^{1}}{\cancel{8}_{2}} \times \frac{\cancel{7}^{1}}{\cancel{9}_{3}} = \frac{1}{6}$

3. $16 \div 4 + 5 \times 3 - 2^3$
$= 16 \div 4 + 5 \times 3 - 8$
$= 4 + 15 - 8$
$= 19 - 8$
$= 11$

4. -9, -8, -3, 0, 2, 4

5. a. $6 \times \frac{1}{3} = \frac{\cancel{6}^{2}}{1} \times \frac{1}{\cancel{3}_{1}} = \frac{2}{1} = 2$

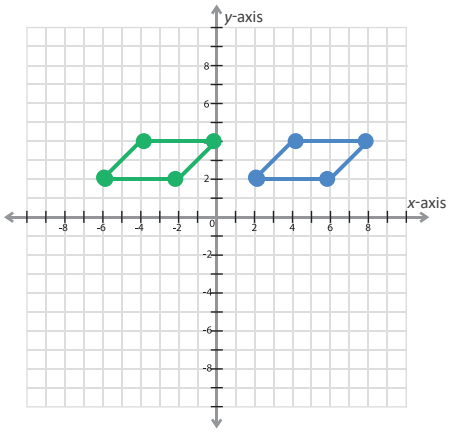
b. $\frac{2}{5} \times 4 = \frac{2}{5} \times \frac{4}{1} = \frac{8}{5} = 1\frac{3}{5}$

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GRAPHING AND TRANSFORMATIONS

Video Lesson

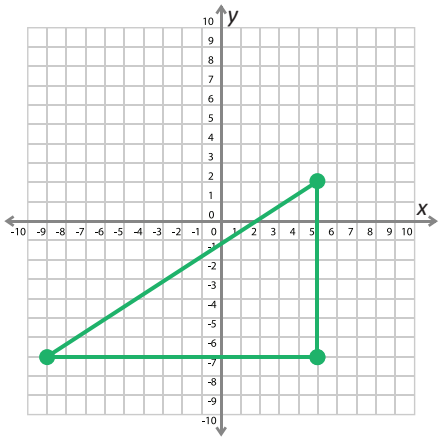
parallelogram



(2, 2), (4, 4), (8, 4), (6, 2)

Practice

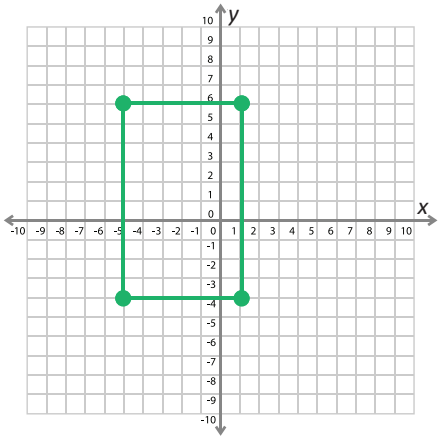
1. a. number of sides: 3
shape may be: triangle



pairs of parallel sides: 0
right angles: 1
sides that are equal in length: 0

triangle

b. number of sides: 4
shape may be: rhombus, trapezium, parallelogram, trapezoid, rectangle, square

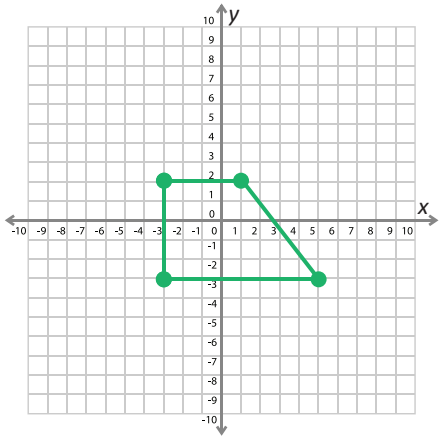


pairs of parallel sides: 2
right angles: 4
pairs of sides that are equal in length: 2

rectangle

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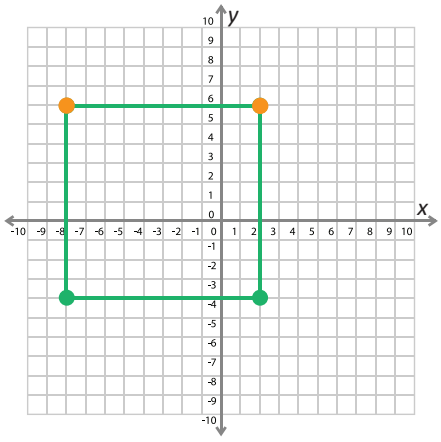
c. number of sides: 4
shape may be: rhombus, trapezium, parallelogram, trapezoid, rectangle, square



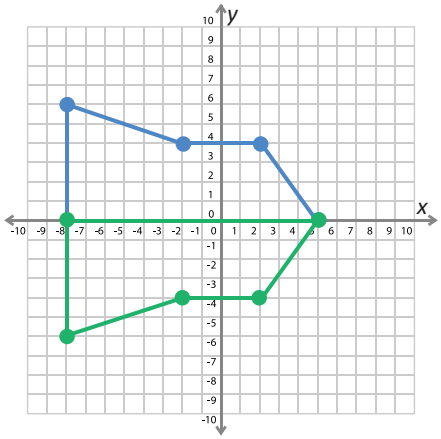
pairs of parallel sides: 1
right angles: 2
sides that are equal in length: 0

trapezoid

2. (-8, 6), (2, 6), (2, -4), (-8, -4)

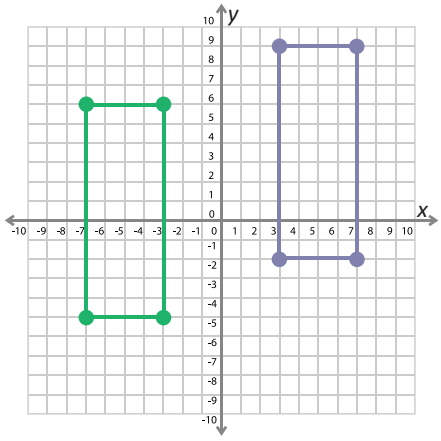


3. (-8, 0), (-8, -6), (-2, -4), (2, -4), (5, 0)



4. The yellow triangle shows a rotation that is in a clockwise direction of 90° around the red dot.

5. (-3, -5), (-7, -5), (-7, 6), (-3, 6)



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Review

1. a. 9 : 12
divide both terms by 3
3 : 4

b. 20 : 15
divide both terms by 5
4 : 3

2. 120°

3. least to greatest: 2, 2, 3, 4, 6, 7

2 + 2 + 3 + 4 + 6 + 7 = 24
There are six numbers.
24 ÷ 6 = 4
mean: 4

2, 2, 3, 4, 6, 7
3 + 4 = 7
There are two numbers.
7 ÷ 2 = 3.5
median: 3.5

2, 2, 3, 4, 6, 7
mode: 2

2, 2, 3, 4, 6, 7
7 - 2 = 5
range: 5

4. a. 195×10^6
The exponent is 6. Add 6 zeros after 195.
$195 \times 10^6 = 195{,}000{,}000$

b. $10{,}300{,}000 \div 10^4$
The exponent is 4. Take 4 zeros off of 10,300,000.
$10{,}300{,}000 \div 10^4 = 1{,}030$

5.
$$\begin{array}{r} 923\frac{2}{5} \\ 5\overline{)4{,}617} \\ -45 \\ \hline 11 \\ -10 \\ \hline 17 \\ -15 \\ \hline 2 \end{array}$$

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USING ZEROS TO SUBTRACT DECIMAL NUMBERS

Video Lesson

$$\begin{array}{r} {\scriptstyle 4\ \ 9} \\ \$5.\overset{1}{\cancel{0}}\overset{1}{\cancel{0}}0 \\ -\ \$1.72 \\ \hline \$3.28 \end{array}$$

Practice

1. a.
$$\begin{array}{r} {\scriptstyle 5\ \ 9} \\ 6.\overset{1}{\cancel{0}}\overset{1}{\cancel{0}}0 \\ -\ 0.09 \\ \hline 5.91 \end{array}$$

b.
$$\begin{array}{r} {\scriptstyle 5} \\ 6.\overset{1}{\cancel{0}}0 \\ -\ 1.6 \\ \hline 4.4 \end{array}$$

c.
$$\begin{array}{r} {\scriptstyle 5\ \ 9} \\ 6.\overset{1}{\cancel{0}}\overset{1}{\cancel{0}}0 \\ -\ 4.07 \\ \hline 1.93 \end{array}$$

2. a.
$$\begin{array}{r} {\scriptstyle 7} \\ 8.\overset{1}{\cancel{0}}0 \\ -\ 4.7 \\ \hline 3.3 \end{array}$$

b.
$$\begin{array}{r} {\scriptstyle 7\ \ 9} \\ 8.\overset{1}{\cancel{0}}\overset{1}{\cancel{0}}0 \\ -\ 7.99 \\ \hline 0.01 \end{array}$$

c.
$$\begin{array}{r} {\scriptstyle 7\ \ 9} \\ 8.\overset{1}{\cancel{0}}\overset{1}{\cancel{0}}0 \\ -\ 1.05 \\ \hline 6.95 \end{array}$$

3. a.
$$\begin{array}{r} {\scriptstyle 3} \\ 8.\overset{1}{\cancel{4}}0 \\ -\ 5.02 \\ \hline 3.38 \end{array}$$

b.
$$\begin{array}{r} {\scriptstyle 3} \\ 8.\overset{1}{\cancel{4}}0 \\ -\ 0.39 \\ \hline 8.01 \end{array}$$

c.
$$\begin{array}{r} {\scriptstyle 3} \\ 8.\overset{1}{\cancel{4}}0 \\ -\ 8.04 \\ \hline 0.36 \end{array}$$

4. a.
$$\begin{array}{r} {\scriptstyle 8\ \ 7} \\ 9.\overset{1}{\cancel{0}}8\overset{1}{\cancel{0}} \\ -\ 7.468 \\ \hline 1.612 \end{array}$$

b.
$$\begin{array}{r} {\scriptstyle 8\ \ 7} \\ 9.\overset{1}{\cancel{0}}8\overset{1}{\cancel{0}} \\ -\ 2.465 \\ \hline 6.615 \end{array}$$

c.
$$\begin{array}{r} {\scriptstyle 7} \\ 9.08\overset{1}{\cancel{0}} \\ -\ 0.056 \\ \hline 9.024 \end{array}$$

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5. 7

6. Sunday
Monday
Tuesday
Wednesday
Thursday
Friday
Saturday

7. Sunday and Saturday should be circled in the above list.

8. 4

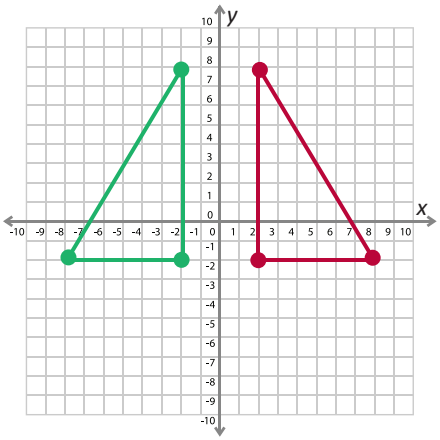
9. 12

10.

January	31	July	31
February	28	August	31
March	31	September	30
April	30	October	31
May	31	November	30
June	30	December	31

Review

1.



(-2, -2), (-8, -2), (-2, 8)

2. area of bottom square: 9 ft × 9 ft = 81 ft^2

area of triangle 1: $\frac{9 \text{ ft} \times 12 \text{ ft}}{2} = \frac{108 \text{ ft}^2}{2} = 54 \text{ ft}^2$

area of triangle 2: $\frac{9 \text{ ft} \times 12 \text{ ft}}{2} = \frac{108 \text{ ft}^2}{2} = 54 \text{ ft}^2$

area of triangle 3: $\frac{9 \text{ ft} \times 12 \text{ ft}}{2} = \frac{108 \text{ ft}^2}{2} = 54 \text{ ft}^2$

area of triangle 4: $\frac{9 \text{ ft} \times 12 \text{ ft}}{2} = \frac{108 \text{ ft}^2}{2} = 54 \text{ ft}^2$

surface area of the square pyramid:
81 ft^2 + 54 ft^2 + 54 ft^2 + 54 ft^2 + 54 ft^2 = 297 ft^2

3. a. 3 : 6
divide both terms by 3
1 : 2

b. 9 : 6
divide both terms by 3
3 : 2

4.

Mixed Number	Improper Fraction
$8\frac{3}{4}$	$\frac{4 \times 8 + 3}{4} = \frac{35}{4}$
$3\overline{)28}$ → $9\frac{1}{3}$, -27, 1	$\frac{28}{3}$

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USING THE DISTRIBUTIVE PROPERTY

Video Lesson

Top Box

$5 \times 18 =$
$5 \times (20 - 2) =$
$(5 \times 20) - (5 \times 2) =$
$100 - 10 =$
90

Bottom Box

$15 \times 24 =$
$15 \times (20 + 4) =$
$(15 \times 20) + (15 \times 4) =$
$300 + 60 =$
360

Practice

1.

a. $4 \times (6 + 9) = (4 \times 6) + (4 \times 9) = 24 + 36 = 60$

b. $6 \times (5 + 8) = (6 \times 5) + (6 \times 8) = 30 + 48 = 78$

c. $5 \times (7 - 3) = (5 \times 7) - (5 \times 3) = 35 - 15 = 20$

d. $9 \times (8 + 7) = (9 \times 8) + (9 \times 7) = 72 + 63 = 135$

2.

a. (given)

b. $9(4 + 10) = (9 \times 4) + (9 \times 10) = 36 + 90 = 126$

c. $8(30 - 1) = (8 \times 30) - (8 \times 1) = 240 - 8 = 232$

d. $7(10 + 3) = (7 \times 10) + (7 \times 3) = 70 + 21 = 91$

3.

3×84 — $3 \times (80 + 4)$

9×13 — $9 \times (10 + 3)$

28×5 — $(20 + 8) \times 5$

7×26 — $7 \times (20 + 6)$

4. Different factors may have been circled. Sample answers are shown for each problem below.

a. (given)

b. 14×11
$(10 + 1)$
$(12 - 1)$

c. 31×19
$(30 + 1)$
$(32 - 1)$

d. 8×22
$(20 + 2)$
$(25 - 3)$

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5. $4 \times 18 = 4 \times (20 - 2) = (4 \times 20) - (4 \times 2) = 80 - 8 = 72$

$12 \times 31 = 12 \times (30 + 1) = (12 \times 30) + (12 \times 1) = 360 + 12 = 372$

6. a. $41 \times 9 = (40 + 1) \times 9 = (40 \times 9) + (1 \times 9) = 360 + 9 = 369$ 369 leaves

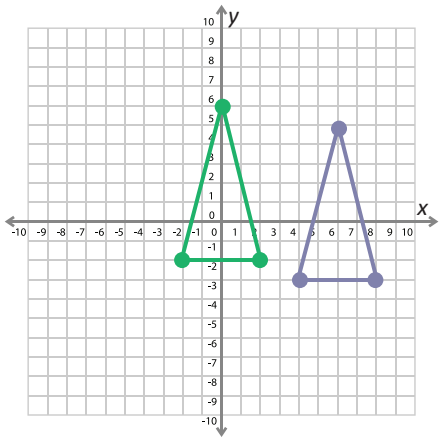
b. $4 \times 98 = 4 \times (100 - 2) = (4 \times 100) - (4 \times 2) = 400 - 8 = 392$ 392 candy bar bits

Review

1.

$$\begin{array}{r} {\scriptstyle 4\ \ 9} \\ 5\not{0}\not{0} \\ -\ 3.4\ 7 \\ \hline 1.5\ 3 \end{array}$$

2.



(0, 6)
(2, -2)
(-2, -2)

3. a. $5\frac{3}{4}$

$$\frac{4 \times 5 + 3}{4} = \frac{23}{4}$$

b. $9\frac{4}{5}$

$$\frac{5 \times 9 + 4}{5} = \frac{49}{5}$$

4. a. $\frac{3}{5} + \frac{2}{3}$

LCM of 5 and 3: 15

$$\frac{3}{5} \times \frac{3}{3} + \frac{2}{3} \times \frac{5}{5}$$
$$= \frac{9}{15} + \frac{10}{15}$$
$$= \frac{19}{15}$$
$$= 1\frac{4}{15}$$

b. $\frac{4}{5} - \frac{3}{4}$

LCM of 5 and 4: 20

$$\frac{4}{5} \times \frac{4}{4} - \frac{3}{4} \times \frac{5}{5}$$
$$= \frac{16}{20} - \frac{15}{20}$$
$$= \frac{1}{20}$$

5. a. $\frac{5}{6}$

b. $\frac{3}{6} = \frac{1}{2}$

c. $\frac{0}{6} = 0$

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MULTIPLYING AND DIVIDING DECIMAL NUMBERS BY POWERS OF 10

Video Lesson

3.14

÷ 10^4
= 0003.14 ÷ 10^4
= 0.000314

× 10^4
= 3.1400 × 10^4
= 31,400

Practice

1. a. $6.12 \times 10^2 = 6.12 \times 10^2 = 612$

b. $73.7 \times 10^2 = 73.70 \times 10^2 = 7{,}370$

c. $122.4 \times 10^2 = 122.40 \times 10^2 = 12{,}240$

d. $0.005 \times 10^2 = 0.005 \times 10^2 = 0.5$

2. a. $168.9 \div 10^3 = 168.9 \div 10^3 = 0.1689$

b. $56.8 \div 10^3 = 056.8 \div 10^3 = 0.0568$

c. $87.42 \div 10^3 = 087.42 \div 10^3 = 0.08742$

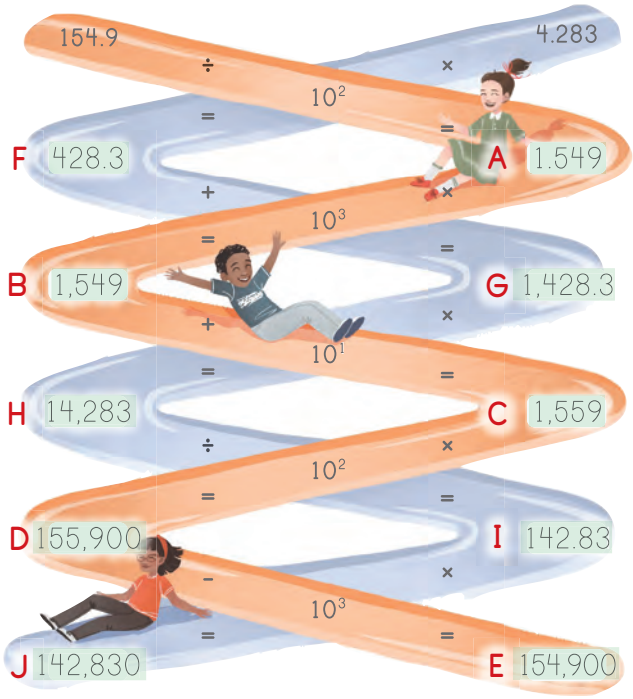
d. $0.23 \div 10^3 = 000.23 \div 10^3 = 0.00023$

3. a. $4.3 \times 10^1 = 4.3 \times 10^1 = 43$
$4.3 \times 10^3 = 4.300 \times 10^3 = 4{,}300$
$4.3 \times 10^5 = 4.30000 \times 10^5 = 430{,}000$

b. $523.6 \div 10^2 = 523.6 \div 10^2 = 5.236$
$523.6 \div 10^4 = 0523.6 \div 10^4 = 0.05236$
$523.6 \div 10^5 = 00523.6 \div 10^5 = 0.005236$

c. $0.697 \times 10^3 = 0.697 \times 10^3 = 697$
$0.697 \times 10^5 = 0.69700 \times 10^5 = 69{,}700$
$0.697 \times 10^6 = 0.697000 \times 10^6 = 697{,}000$

4. Work for each problem is shown below.



A $154.9 \div 10^2 = 154.9 \div 10^2 = 1.549$

B $1.549 \times 10^3 = 1.549 \times 10^3 = 1{,}549$

C $1{,}549 + 10^1 = 1{,}549 + 10 = 1{,}559$

D $1{,}559 \times 10^2 = 1{,}559.00 \times 10^2 = 155{,}900$

E $155{,}900 - 10^3 = 155{,}900 - 1{,}000 = 154{,}900$

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F $4.283 \times 10^2 = 4.283 \times 10^2 = 428.3$

G $428.3 + 10^3 = 428.3 + 1{,}000 = 1{,}428.3$

H $1{,}428.3 \times 10^1 = 1{,}428.3 \times 10^1 = 14{,}283$

I $14{,}283 \div 10^2 = 14{,}283 \div 10^2 = 142.83$

J $142.83 \times 10^3 = 142.830 \times 10^3 = 142{,}830$

5. a. $28.6 \times 10^1 = 28.6 \times 10^1 = 586$

b. $0.137 \times 10^5 = 0.13700 \times 10^5 = 13{,}700$

Review

1. $12 \times 52 =$
$12 \times (50 + 2) =$
$(12 \times 50) + (12 \times 2) =$
$600 + 24 =$
624

2. a. $\frac{22}{60}$
divide both terms by 2
$\frac{11}{30}$

b. $\frac{72}{45}$
divide both terms by 9
$\frac{8}{5}$

3. a. $0.3 = \frac{3}{10}$

b. $8.02 = 8\frac{2}{100} = 8\frac{1}{50}$

4. $\frac{\cancel{5}^{1}}{\cancel{7}_{1}} \times \frac{\cancel{3}^{1}}{\cancel{10}_{\cancel{2}_{1}}} \times \frac{\cancel{14}^{\cancel{2}^{1}}}{\cancel{9}_{3}} = \frac{1}{3}$

5. a. $\underline{7}501$
round up
8

b. Half of 26 is 13. 9 is less than 13.
$\frac{9}{26}$ is less than $\frac{1}{2} \longrightarrow$ round down
$\frac{9}{26} \longrightarrow 0$

6. a.
$$\begin{array}{r} {\scriptstyle 0}\cancel{1}.{}^{1}0 \\ -\ 0.4 \\ \hline 0.6 \end{array}$$

b.
$$\begin{array}{r} {\scriptstyle 0\ \ 9}\\ \cancel{1}.{}^{1}\cancel{0}{}^{1}0 \\ -\ 0.35 \\ \hline 0.65 \end{array}$$

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TIME REVIEW

Practice

1. Work for each problem on the correct path is shown below.



START Ping wakes up at quarter to 6 in the morning.	6:15 AM Ping plays at a friend's house for half an hour.	6:45 AM Ping swims for 43 minutes.	7:28 AM Ping reads for an hour.	10:15 PM Ping goes to the library for a quarter of an hour.
A 5:45 AM Ping spends 7 minutes getting dressed. →	**B** 5:52 AM Ping plays fetch in the yard with his dog for 15 minutes. →	**C** 6:07 AM Ping practices the violin and reads for an hour and a half. ↓	8:28 AM Ping plays chess with his brother for 20 minutes.	8:48 AM Ping works on an art project. He works until half past 10.
12:00 PM Ping bakes bread for one hour.	11:30 AM Ping breaks for lunch until noon.	**D** 7:37 AM Ping takes care of his pets for 20 minutes. ↓	**M** 6:45 PM Ping reads for one and a half hours. →	**N** 8:15 PM Ping brushes his teeth for 3 minutes. ↓
G 12:30 PM Ping has lunch with his brother. He arrives at violin lessons a half hour later. ↓	**F** 8:27 AM Ping works on math and language arts. He finishes at half past 12 in the afternoon. ←	**E** 7:57 AM Ping eats breakfast with his family for a half hour. ←	**L** 6:15 PM Ping helps clean his home for a half hour. ↑	**O** 8:18 PM Ping gets in bed at quarter after 9 at night. ↓
H 1:00 PM Ping's lesson lasts 1 hour 15 minutes. →	**I** 2:15 PM Ping works on a project for his dad until 5 after 4. →	**J** 4:05 PM Ping helps his mom make dinner. Dinner is ready at half past 5. →	**K** 5:30 PM Ping eats with his family for 45 minutes. ↑	9:15 PM Night night!



A 5:45 AM + 7 minutes = 5:52 AM

B 5:52 AM to 6:00 AM is 8 minutes.
15 - 8 = 7
6:00 AM + 7 minutes = 6:07 AM

C 6:07 AM + 1 hour = 7:07 AM
7:07 AM + 30 minutes = 7:37 AM

D 7:37 AM + 20 minutes = 7:57 AM

E 7:57 AM to 8:00 AM is 3 minutes.
30 - 3 = 27
8:00 AM + 27 minutes = 8:27 AM

F "Half past 12" is 12:30 PM.

G 12:30 PM + 30 minutes = 1:00 PM

H 1:00 PM + 1 hour = 2:00 PM
2:00 PM + 15 minutes = 2:15 PM

I "5 after 4" is 4:05 PM.

J "Half past 5" is 5:30 PM.

K 5:30 to 6:00 PM is 30 minutes.
45 - 30 = 15
6:00 PM + 15 minutes = 6:15 PM

L 6:15 PM + 30 minutes = 6:45 PM

M 6:45 PM + 1 hour = 7:45 PM
7:45 PM to 8:00 PM is 15 minutes.
30 - 15 = 15
8:00 PM + 15 minutes = 8:15 PM

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N 8:15 PM + 3 minutes = 8:18 PM

O "A quarter after 9" is 9:15 PM.

2. a. minutes

b. hours

c. seconds

d. century (100 years)

e. days

f. millenniums (1,000 years)

g. years

h. decade (10 years)

i. months

j. week

3. a. Midori

b. Zen

c. 52 - 39 = 13
13 seconds

d. 34 + 38 + 39 + 39 + 44 + 52 = 246
There are 6 numbers.
246 ÷ 6 = 41
mean: 41

e. least to greatest: 34, 38, 39, 39, 44, 52
39 + 39 = 78
There are 2 numbers.
78 ÷ 2 = 39
median: 39

f. 34, 38, 39, 39, 44, 52
mode: 39

g. 34, 38, 39, 39, 44, 52
52 - 34 = 18
range: 18

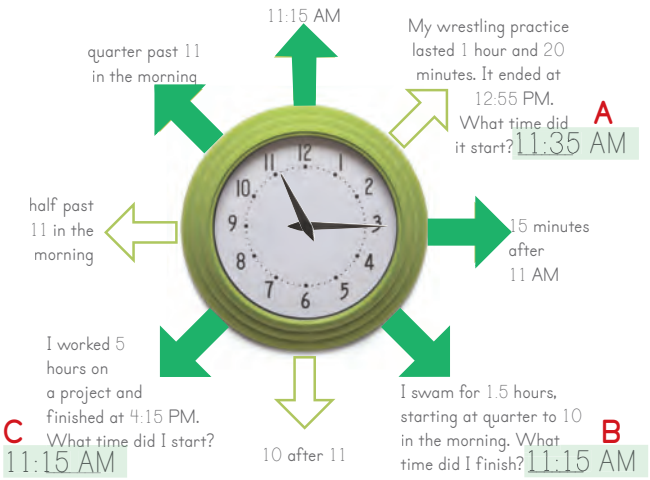
4. a. 8:15 AM + 1 hour = 9:15 AM
9:15 AM + 30 minutes = 9:45 AM

b. 3 hours 42 minutes is 18 minutes less than 4 hours. John took 18 minutes more plus 27 minutes more.
18 + 27 = 45 45 minutes

5. a. 3:15 AM + 1 hour = 4:15 AM
4:15 AM + 13 minutes = 4:28 AM
1 hour(s) 13 minute(s)

b. 7:30 PM + 1 hour = 8:30 PM
8:30 PM + 42 minutes = 9:12 PM
1 hour(s) 42 minute(s)

6. Work for each problem is shown below.



A 1 hour before 12:55 PM is 11:55 AM.
20 minutes before 11:55 AM is 11:35 AM.

B "A quarter to 10 in the morning" is 9:45 AM.
9:45 AM + 1 hour = 10:45 AM
10:45 AM + 30 minutes = 11:15 AM

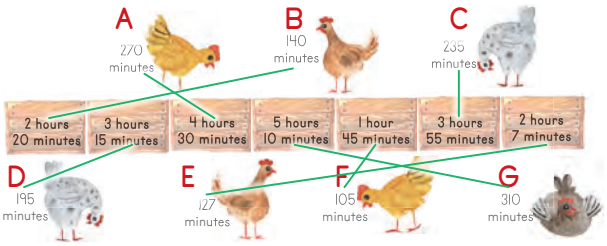
C Five hours before 4:15 PM is 11:15 AM.

7. a. 7:30, half past 7

b. 1:10, 10 after 1

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8. Work for each problem is shown below.



A $60 \times 4 = 240$
$270 - 240 = 30$
4 hours 30 minutes

B $60 \times 2 = 120$
$140 - 120 = 20$
2 hours 20 minutes

C $60 \times 3 = 180$
$235 - 180 = 55$
3 hours 55 minutes

D $60 \times 3 = 180$
$195 - 180 = 15$
3 hours 15 minutes

E $60 \times 2 = 120$
$127 - 120 = 7$
2 hours 7 minutes

F $60 \times 1 = 60$
$105 - 60 = 45$
1 hour 45 minutes

G $60 \times 5 = 300$
$310 - 300 = 10$
5 hours 10 minutes

9. a.



b.



c.



d.



MULTIPLYING DECIMAL NUMBERS

Video Lesson

$$\begin{array}{r} {\scriptstyle 1\ 1\ \ 2}\\ 5.35\\ \times\ \ 4.2\\ \hline 1070\\ +\,21400\\ \hline 22470 \end{array}$$

(3 decimal places)

$22.47

Practice

1.

2.5 × 3	1	7.5
8 × 4.71	2	37.68
0.43 × 1.09	4	0.4687
3.65 × 0.7	3	2.555

2. a.
$$\begin{array}{r} {\scriptstyle 2}\\ \$0.40\\ \times\ \ 7\\ \hline \$2.80 \end{array}$$

(2 decimal places)

b.
$$\begin{array}{r} {\scriptstyle 5}\\ \$5.07\\ \times\ \ 8\\ \hline \$40.56 \end{array}$$

(2 decimal places)

c.
$$\begin{array}{r} {\scriptstyle 1\ 1}\\ \$0.65\\ \times\ \ 3\\ \hline \$1.95 \end{array}$$

(2 decimal places)

d.
$$\begin{array}{r} {\scriptstyle 2}\\ \$8.03\\ \times\ \ 7\\ \hline \$56.21 \end{array}$$

(2 decimal places)

3. a. 0.07 is less than 1. 4 times a number less than 1 will be less than 4.

$4 \times 0.07 < 4$

b. 6.8 is greater than 1. 3 times a number greater than 1 will be greater than 3.

$3 \times 6.8 > 3$

c. 0.97 is less than 1. 15 times a number less than 1 will be less than 15.

$15 \times 0.97 < 15$

d. 8.05 is greater than 1. 7 times a number greater than 1 will be greater than 7.

$7 \times 8.05 > 7$

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4. a.
$$\begin{array}{r} {\scriptstyle 1}\\ 1.2\\ \times\ 8.3\\ \hline 36\\ +\ 9\,60\\ \hline 9.96 \end{array}$$
(2 decimal places)

b.
$$\begin{array}{r} {\scriptstyle 4\ 1}\\ 4.52\\ \times\ 0.08\\ \hline 0.36\,16 \end{array}$$
(4 decimal places)

5. a.
$$\begin{array}{r} {\scriptstyle 3}\\ 1.6\\ \times\ 5\\ \hline 8.0 \end{array}$$
(1 decimal place)

8 miles

b.
$$\begin{array}{r} {\scriptstyle 3}\\ \$2.15\\ \times\ 6\\ \hline \$12.90 \end{array}$$
(2 decimal places)

c.
$$\begin{array}{r} {\scriptstyle 2\ 4}\\ 2.25\\ \times\ 8\\ \hline 18.00 \end{array}$$
(2 decimal places)

18 meters

Review

1. a. $3.47 \times 10^5 = 3.47000 \times 10^5 = 347{,}000$

b. $97{,}807.3 \div 10^5 = 97{,}807.3 \div 10^5 = 0.978073$

2.
$13 \times 22 =$
$13 \times (20 + 2) =$
$(13 \times 20) + (13 \times 2) =$
$260 + 26 =$
286

3. a.
$$\begin{array}{r} {\scriptstyle 0\ 9}\\ {\scriptstyle 1\ 1}\\ 1.\cancel{0}\,0\\ -\ 0.3\,5\\ \hline 0.6\,5 \end{array}$$

b.
$$\begin{array}{r} {\scriptstyle 7}\\ {\scriptstyle 1}\\ \cancel{8}.0\\ -\ 7.3\\ \hline 0.7 \end{array}$$

4. factors of 12: 1, 2, 3, 4, 6, 12
factors of 24: 1, 2, 3, 4, 6, 8, 12, 24
factors of 36: 1, 2, 3, 4, 6, 9, 12, 18, 36

GCF of 12, 24, and 36: 12

5. Each figure has more than one correct name. All possible answers are shown below.

a. $\overleftrightarrow{QR}$, $\overleftrightarrow{QS}$, $\overleftrightarrow{RS}$, $\overleftrightarrow{RQ}$, $\overleftrightarrow{SR}$, $\overleftrightarrow{SQ}$

b. $\triangle LRW$, $\triangle LWR$, $\triangle RWL$, $\triangle RLW$, $\triangle WLR$, $\triangle WRL$

6. a. (given)

b. $\frac{12}{25} \times \frac{4}{4} = \frac{48}{100} = 48\%$

c. $\frac{33}{50} \times \frac{2}{2} = \frac{66}{100} = 66\%$

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ELAPSED TIME

Video Lesson

Time	Interval	
7:25 PM	end time	
7:25 AM	12 hr	] 14 hr
5:25 AM	2 hr	
5:00 AM	25 min	] 52 min
4:33 AM	27 min	

start time: 4:33 AM

Practice

1. a.

Time	Interval
5:30 AM	start time
5:30 PM	12 hr
5:48 PM	18 min

end time: 5:48 PM

b.

Time	Interval	
11:20 AM	start time	
4:20 PM	5 hr	] 5 hr
5:00 PM	40 min	] 42 min
5:02 PM	2 min	

end time: 5:02 PM

2. a.

Time	Interval
10:03 PM	start time
7:03 AM	9 hr
7:49 AM	46 min

elapsed time: 9 hr 46 min

b.

Time	Interval	
7:54 AM	start time	
7:54 PM	12 hr	] 15 hr
10:54 PM	3 hr	
11:00 PM	6 min	] 26 min
11:20 PM	20 min	

elapsed time: 15 hr 26 min

3. a.

Time	Interval	
6:10 PM	end time	
6:10 AM	12 hr	] 15 hr
3:10 AM	3 hr	
3:00 AM	10 min	] 55 min
2:15 AM	45 min	

start time: 2:15 AM

b.

Time	Interval	
2:32 PM	end time	
7:32 AM	7 hr	] 7 hr
7:00 AM	32 min	] 52 min
6:40 AM	20 min	

start time: 6:40 AM

4.

Time	Interval	
7:15 AM	end time	
12:15 AM	7 hr	] 10 hr
9:15 PM	3 hr	
9:00 PM	15 min	] 20 min
8:55 PM	5 min	

8:55 PM

5. Answers will vary.

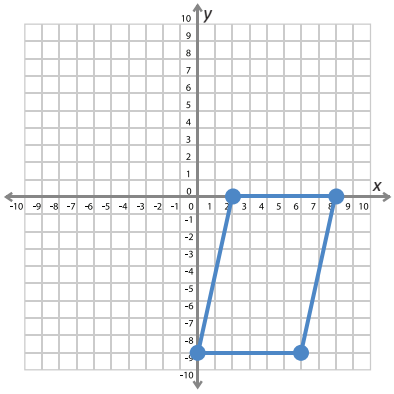
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Review

1.

$$\begin{array}{r} {\scriptstyle 5\ 2\ 2} \\ 3.623 \\ \times\quad 0.9 \\ \hline 3.2607 \end{array}$$

2.



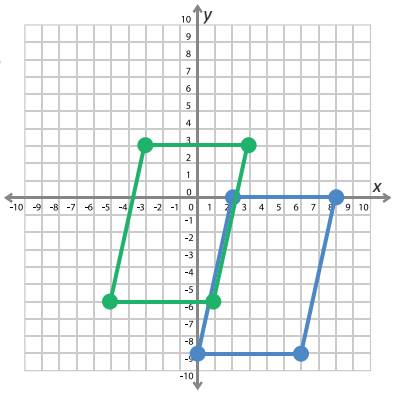
pairs of parallel lines: 2

right angles: 0

pairs of sides that are equal in length: 2

parallelogram

3.



(-5, -6), (1, -6), (3, 3), (-3, 3)

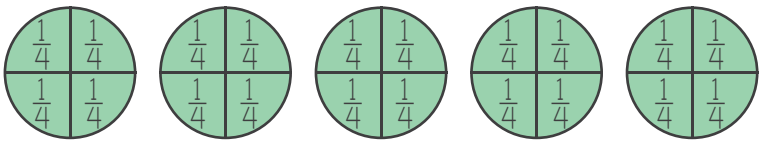
4.

$$\begin{array}{r} 12\frac{1}{24} \\ 24\overline{)289} \\ -24 \\ \hline 49 \\ -48 \\ \hline 1 \end{array}$$

DIVIDING BY UNIT FRACTIONS USING PICTURES

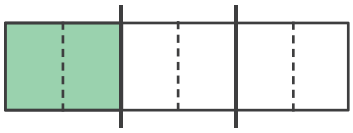
Video Lesson

Top Box



$5 \div \frac{1}{4} = 20$

Bottom Box

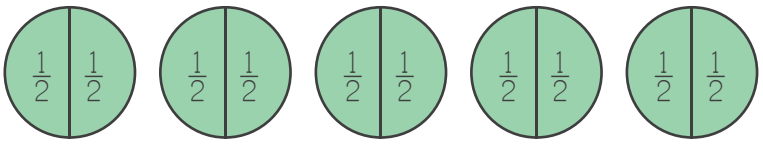


$\frac{1}{3} \div \frac{1}{6} = 2$

Practice

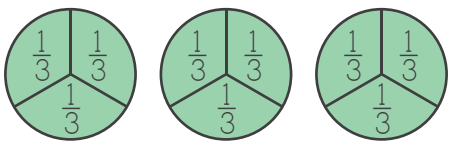
1. a. thirds, three
halves, five
fifths, four

b. $5 \div \frac{1}{2}$



$5 \div \frac{1}{2} = 10$

$3 \div \frac{1}{3}$



$3 \div \frac{1}{3} = 9$

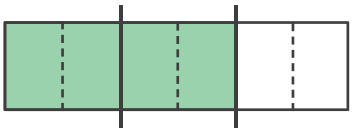
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2. a. $\frac{2}{3} \div \frac{1}{6}$

$\frac{1}{3} \div \frac{1}{9}$

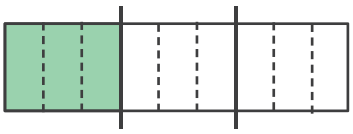
$\frac{4}{5} \div \frac{1}{10}$

b. $\frac{2}{3} \div \frac{1}{6}$



$\frac{2}{3} \div \frac{1}{6} = 4$

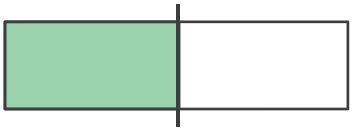
$\frac{1}{3} \div \frac{1}{9}$



$\frac{1}{3} \div \frac{1}{9} = 3$

3. a. $\frac{1}{2} \div \frac{1}{2}$

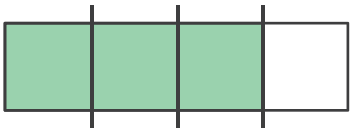
There is one half in one-half.



$\frac{1}{2} \div \frac{1}{2} = 1$

b. $\frac{3}{4} \div \frac{1}{4}$

There are three fourths in three-fourths.



$\frac{3}{4} \div \frac{1}{4} = 3$

c. $1 \div \frac{1}{3}$

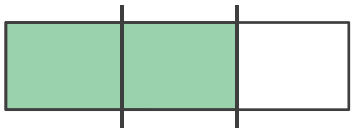
There are three thirds in 1 whole.



$1 \div \frac{1}{3} = 3$

d. $\frac{2}{3} \div \frac{1}{3}$

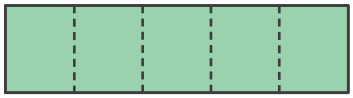
There are two thirds in two-thirds.



$\frac{2}{3} \div \frac{1}{3} = 2$

e. $1 \div \frac{1}{5}$

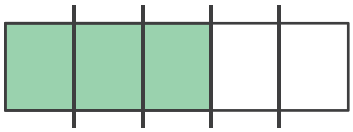
There are five fifths in 1 whole.



$1 \div \frac{1}{5} = 5$

f. $\frac{3}{5} \div \frac{1}{5}$

There are three fifths in three-fifths.



$\frac{3}{5} \div \frac{1}{5} = 3$

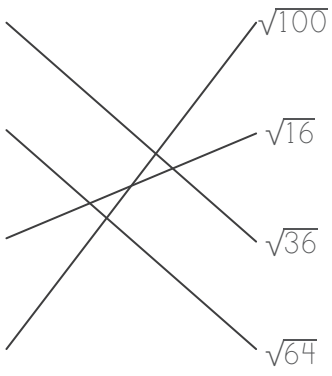
4. Work for each problem is shown on the next page.

A $3 \div \frac{1}{2} = 6$

B $1 \div \frac{1}{8} = 8$

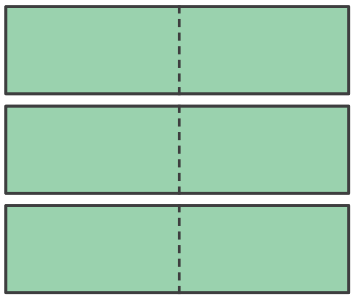
C $\frac{4}{7} \div \frac{1}{7} = 4$

D $2 \div \frac{1}{5} = 10$



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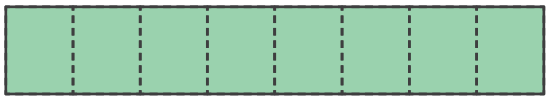
A $3 \div \frac{1}{2}$



$3 \div \frac{1}{2} = 6$

$\sqrt{36} = 6$

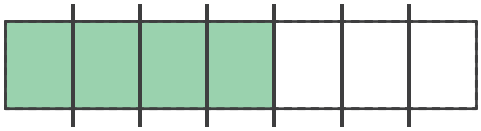
B $1 \div \frac{1}{8}$



$1 \div \frac{1}{8} = 8$

$\sqrt{64} = 8$

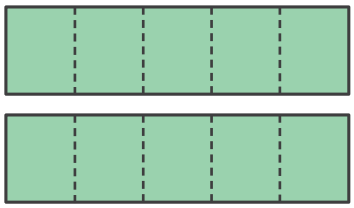
C $\frac{4}{7} \div \frac{1}{7}$



$\frac{4}{7} \div \frac{1}{7} = 4$

$\sqrt{16} = 4$

D $2 \div \frac{1}{5}$



$2 \div \frac{1}{5} = 10$

$\sqrt{100} = 10$

Review

1.

Time	Interval	
5:45 AM	start time	
5:45 PM	12 hr	] 13 hr
6:45 PM	1 hr	
7:00 PM	15 min	] 53 min
7:38 PM	38 min	

elapsed time: 13 hr 53 min

2.

$$\begin{array}{r} {\scriptstyle \not{8}\,\not{4}} \\ 8.43 \\ \times\ \ 10.9 \\ \hline 7587 \\ 0000 \\ +\ {\scriptstyle 1}84300 \\ \hline 91.887 \end{array}$$

3.



3:45

4. $0.56 \times 10^0 = 0.56$

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MATH PUZZLES

Practice

1. Total number of animals: 120 + 30 + 90 + 60 + 60 = 360

Animal	Ratio of Animal to Total Animals
Bison	$\frac{120}{360} = \frac{1}{3}$
Bears	$\frac{30}{360} = \frac{1}{12}$
Birds	$\frac{90}{360} = \frac{1}{4}$
Elk	$\frac{60}{360} = \frac{1}{6}$
Wolves	$\frac{60}{360} = \frac{1}{6}$

2. Trail 1 with obstacles:

$$\begin{array}{r} {\scriptstyle 2} \\ 33.000 \\ 1.209 \\ 0.023 \\ 0.407 \\ 0.023 \\ +\ 0.023 \\ \hline 34.685 \end{array}$$

Trail 2 with obstacles:

$$\begin{array}{r} {\scriptstyle 1} \\ 35.000 \\ 0.210 \\ 0.407 \\ +\ 1.209 \\ \hline 36.826 \end{array}$$

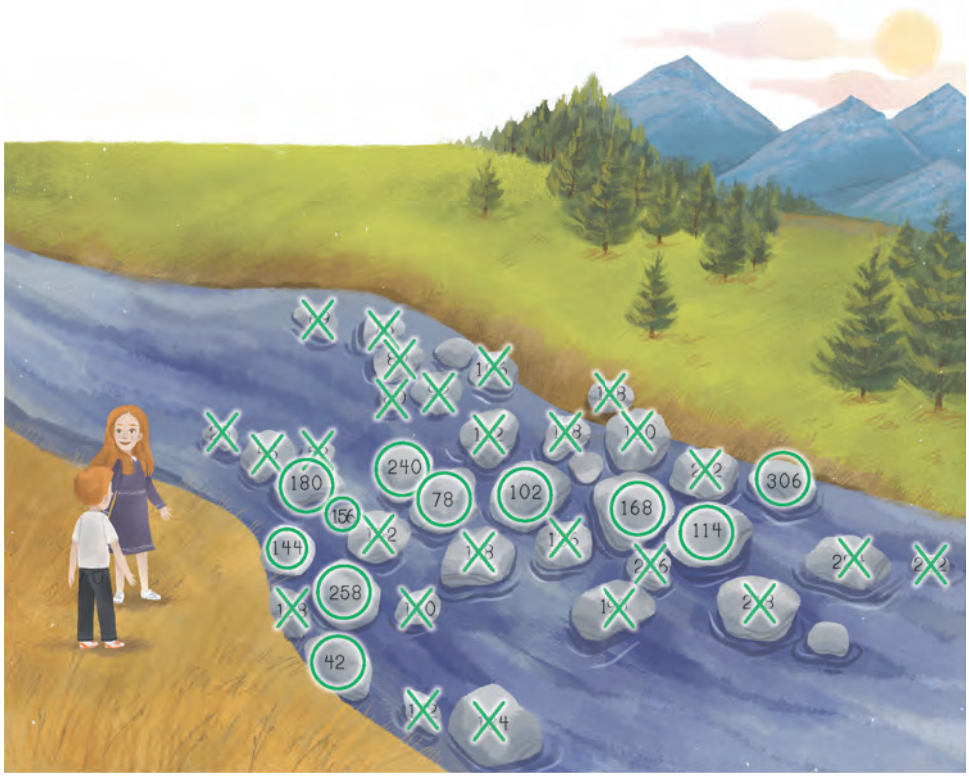
Trail 3 with obstacles:

$$\begin{array}{r} {\scriptstyle 2} \\ 34.000 \\ 0.023 \\ 1.209 \\ 0.407 \\ +\ 0.023 \\ \hline 35.662 \end{array}$$

Time:	Trail:
34.685 min	1
35.662 min	3
36.826 min	2

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3. Detailed work is shown below.



If the number is divisible by both 2 and 3, it is also divisible by 6.

Even numbers are divisible by 2. Cross off all odd numbers. Cross off 69, 73, 89, 25, 45.

Choose a rock to start on and see if it is divisible by 3. Then look for a nearby rock that has not been crossed off and check to see if it is divisible by 3. Continue checking rocks for divisibility by 3.

Students will not need to check all rocks in the stream, but divisibility work for each even number is shown below.

106: 1 + 6 = 7	7 is not divisible by 3, so 106 is not divisible by 3.
112: 1 + 1 + 2 = 4	4 is not divisible by 3, so 112 is not divisible by 3.
80: 8 + 0 = 8	8 is not divisible by 3, so 80 is not divisible by 3.
92: 9 + 2 = 11	11 is not divisible by 3, so 92 is not divisible by 3.
130: 1 + 3 + 0 = 4	4 is not divisible by 3, so 130 is not divisible by 3.
118: 1 + 1 + 8 = 10	10 is not divisible by 3, so 118 is not divisible by 3.
128: 1 + 2 + 8 = 11	11 is not divisible by 3, so 128 is not divisible by 3.
136: 1 + 3 + 6 = 10	10 is not divisible by 3, so 136 is not divisible by 3.
52: 5 + 2 = 7	7 is not divisible by 3, so 52 is not divisible by 3.
240: 2 + 4 + 0 = 6	6 is divisible by 3, so 240 is divisible by 3.
148: 1 + 4 + 8 = 13	13 is not divisible by 3, so 148 is not divisible by 3.
224: 2 + 2 + 4 = 8	8 is not divisible by 3, so 224 is not divisible by 3.
306: 3 + 0 + 6 = 9	9 is divisible by 3, so 306 is divisible by 3.
180: 1 + 8 + 0 = 9	9 is divisible by 3, so 180 is divisible by 3.

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156: 1 + 5 + 6 = 12	12 is divisible by 3, so 156 is divisible by 3.
78: 7 + 8 = 15	15 is divisible by 3, so 78 is divisible by 3.
102: 1 + 0 + 2 = 3	3 is divisible by 3, so 102 is divisible by 3.
168: 1 + 6 + 8 = 15	15 is divisible by 3, so 168 is divisible by 3.
114: 1 + 1 + 4 = 6	6 is divisible by 3, so 114 is divisible by 3.
144: 1 + 4 + 4 = 9	9 is divisible by 3, so 144 is divisible by 3.
160: 1 + 6 + 0 = 7	7 is not divisible by 3, so 160 is not divisible by 3.
158: 1 + 5 + 8 = 14	14 is not divisible by 3, so 158 is not divisible by 3.
152: 1 + 5 + 2 = 8	8 is not divisible by 3, so 152 is not divisible by 3.
218: 2 + 1 + 8 = 11	11 is not divisible by 3, so 218 is not divisible by 3.
172: 1 + 7 + 2 = 10	10 is not divisible by 3, so 172 is not divisible by 3.
258: 2 + 5 + 8 = 15	15 is divisible by 3, so 258 is divisible by 3.
184: 1 + 8 + 4 = 13	13 is not divisible by 3, so 184 is not divisible by 3.
212: 2 + 1 + 2 = 5	5 is not divisible by 3, so 212 is not divisible by 3.
232: 2 + 3 + 2 = 7	7 is not divisible by 3, so 232 is not divisible by 3.
42: 4 + 2 = 6	6 is divisible by 3, so 42 is divisible by 3.
190: 1 + 9 + 0 = 10	10 is not divisible by 3, so 190 is not divisible by 3.
206: 2 + 0 + 6 = 8	8 is not divisible by 3, so 206 is not divisible by 3.

4. Answers will vary, but the numbers should match what is below.

There are 25 total insects. $\frac{2}{5}$ of 25 is 10. 10 insects should have stripes.

25 - 10 is 15. There are 15 remaining insects. $\frac{1}{3}$ of 15 is 5. 5 insects should be crossed off.

15 - 5 = 10. There are 10 remaining insects. 50% of 10 is 5. 5 insects should be circled.

10 - 5 = 5. There are 5 remaining insects that do not have stripes, are not crossed off, and are not circled.

5 × 3 = 15

15 days

5. a. There are 6 red birds. 50% of 6 is 3. 3 red birds flew away, so 3 red birds are left.

There are 10 blue birds. $\frac{1}{5}$ of 10 is 2. 2 blue birds left, so 8 blue birds are left.

There are 2 brown birds. 2 × 4 = 8. There are now 8 brown birds in the tree.

3 + 8 + 8 = 19

19 birds

b. yes

CONVERTING UNITS OF CAPACITY

Video Lesson

Top Box

2 cups = 1 pint

$15 \div 2 = 7\frac{1}{2}$

15 c = $7\frac{1}{2}$ pt

$7\frac{1}{2}$ pt < 8 pt

15 c < 8 pt

Bottom Box

555 ÷ 1,000 = 0.555

555 mL = 0.555 L

4.2 L + 0.555 L = 4.755 L

Practice

1.

a. 1 L = 1,000 mL

b. 61 × 1,000 = 61,000
61 L = 61,000 mL

c. 0.45 × 1,000 = 450
0.45 L = 450 mL

d. 9.24 × 1,000 = 9,240
9.24 L = 9,240 mL

2.

a. 1,000 mL = 1 L

b. 240 ÷ 1,000 = 0.240
240 mL = 0.24 L

c. 4,415 ÷ 1,000 = 4.415
4,415 mL = 4.415 L

d. 7 ÷ 1,000 = 0.007
7 mL = 0.007 L

3.

a. 1 gal = 4 qt

b. 1 gal = 4 qt
2.1 × 4 = 8.4
2.1 gal = 8.4 qt

c. 1 qt = 2 pt

d. 1 qt = 2 pt
3 × 2 = 6
3 qt = 6 pt

e. 1 pt = 2 c

f. 1 pt = 2 c
5.3 × 2 = 10.6
5.3 pt = 10.6 c

g. 1 c = 8 fl oz

h. 1 c = 8 fl oz
3.4 × 8 = 27.2
3.4 c = 27.2 fl oz

4.

a. 3 tsp = 1 Tbsp

b. 8 fl oz = 1 c
16 ÷ 8 = 2
16 fl oz = 2 c

c. 4 c = 1 qt
8 ÷ 4 = 2
8 c = 2 qt

d. 2 pt = 1 qt
10 ÷ 2 = 5
10 pt = 5 qt

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e. 16 c = 1 gal
32 ÷ 16 = 2
32 c = 2 gal

f. 4 qt = 1 gal
12 ÷ 4 = 3
12 qt = 3 gal

5. a. 5 × 1,000 = 5,000
5 L = 5,000 mL
5,000 mL + 8 mL = 5,008 mL

b. 4 × 1,000 = 4,000
4 L = 4,000 mL
4,000 mL + 39 mL = 4,039 mL

c. 1 × 1,000 = 1,000
1 L = 1,000 mL
1,000 mL + 524 mL = 1,524 mL

6. a. 16 c = 1 gal
8 pt = 1 gal

1 gal + 1 gal = 2 gal

b. 16 c = 1 gal
32 ÷ 16 = 2
32 c = 2 gal

4 qt = 1 gal
2 gal + 1 gal = 3 gal

c. 1 qt = 2 pt
11 qt = 22 pt

22 pt + 2 pt = 24 pt

8 pt = 1 gal
24 ÷ 8 = 3

24 pt = 3 gal

7. a. 4 qt = 1 gal
8 ÷ 4 = 2

8 qt = 2 gal

b. 2 pt = 1 qt
4 ÷ 2 = 2
4 pt = 2 qt

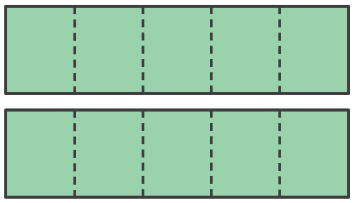
4 pt > 1 qt

c. 8 fl oz = 1 c
3 × 8 = 24
3 c = 24 oz

30 fl oz > 3 c

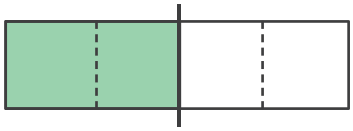
Review

1. a. $2 \div \frac{1}{5}$



$2 \div \frac{1}{5} = 10$

b. $\frac{1}{2} \div \frac{1}{4}$



$\frac{1}{2} \div \frac{1}{4} = 2$

2.

Time	Interval	
8:55 AM	start time	
2:55 PM	6 hr	] 6 hr
3:00 PM	5 min	] 21 min
3:16 PM	16 min	

end time: 3:16 PM

3. a. $\frac{\cancel{6}^{1}}{\cancel{11}_{1}} \times \frac{\cancel{8}^{1}}{\cancel{8}_{1}} \times \frac{\cancel{15}^{1}}{\cancel{15}_{3}} \times \frac{\cancel{3}^{1}}{\cancel{3}_{1}} = \frac{1}{3}$

b. $18 \times \frac{1}{3} = \frac{\cancel{18}^{6}}{1} \times \frac{1}{\cancel{3}_{1}} = \frac{6}{1} = 6$

4. $\frac{3}{4} + \frac{1}{6} + \frac{1}{3}$

LCM of 4, 6, and 3: 12

$\frac{3}{4} \times \frac{3}{3} + \frac{1}{6} \times \frac{2}{2} + \frac{1}{3} \times \frac{4}{4}$

$= \frac{9}{12} + \frac{2}{12} + \frac{4}{12}$

$= \frac{15}{12}$

$= 1\frac{3}{12} = 1\frac{1}{4}$

5.

$$\begin{array}{r} {}^{4}\cancel{9}^{1}\cancel{0}^{1}0 \\ -\ 1.0\,0\,4 \\ \hline 8.4\,9\,6 \end{array}$$

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CONVERTING BETWEEN DECIMAL NUMBERS AND PERCENTS

Video Lesson

Percents	Decimals
0.72 ⟶ 0.72% ⟶ 72% 0.72 = 72%	12% ⟶ 12% ⟶ 0.12 12% = 0.12
0.054 ⟶ 0.054% ⟶ 5.4% 0.054 = 5.4%	34.5% ⟶ 34.5% ⟶ 0.345 34.5% = 0.345
8.8 ⟶ 8.80% ⟶ 880% 8.8 = 880%	500% ⟶ 500% ⟶ 5 500% = 5

Letters: O R F E L W

Secret word: FLOWER

Practice

1.

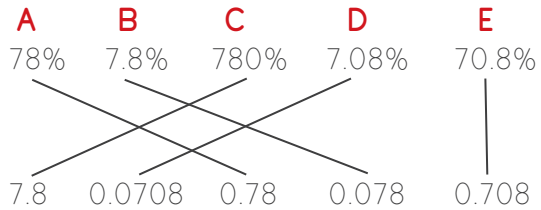
a. decimal number: 0.61
percent: 61%

b. decimal number: 0.08
percent: 8%

c. decimal number: 0.29
percent: 29%

d. decimal number: 0.97
percent: 97%

2. Work for each problem is shown below.



A 78% ⟶ 78% ⟶ 0.78
B 7.8% ⟶ 07.8% ⟶ 0.078
C 780% ⟶ 780% ⟶ 7.8
D 7.08% ⟶ 07.08% ⟶ 0.0708
E 70.8% ⟶ 70.8% ⟶ 0.708

3.

a. 0.72 ⟶ 0.72% ⟶ 72%
0.72 = 72%

b. 0.008 ⟶ 0.008% ⟶ 0.8%
0.008 = 0.8%

c. 0.902 ⟶ 0.902% ⟶ 90.2%
0.902 = 90.2%

d. 4 ⟶ 4.00% ⟶ 400%
4 = 400%

e. 2.024 ⟶ 2.024% ⟶ 202.4%
2.024 = 202.4%

f. 9.81 ⟶ 9.81% ⟶ 981%
9.81 = 981%

4.

a. 18% ⟶ 18% ⟶ 0.18
18% = 0.18

b. 12.6% ⟶ 12.6% ⟶ 0.126
12.6% = 0.126

c. 90% ⟶ 90% ⟶ 0.9
90% = 0.9

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d. 58% ⟶ 58% ⟶ 0.58
58% = 0.58

e. 300% ⟶ 300% ⟶ 3
300% = 3

f. 1.12% ⟶ 01.12% ⟶ 0.0112
1.12% = 0.0112

5. 21%, 0.21
33%, 0.33
20%, 0.2
11%, 0.11
15%, 0.15

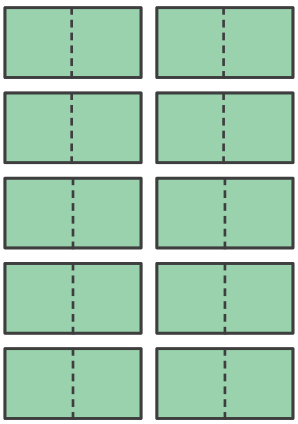
0.21 + 0.33 + 0.2 + 0.11 + 0.15 = 1

Review

1. a. 1 L = 1,000 mL
3 × 1,000 = 3,000
3 L = 3,000 mL

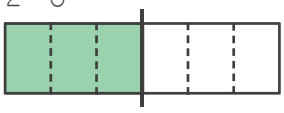
b. 3 tsp = 1 Tbsp
9 ÷ 3 = 3
9 tsp = 3 Tbsp

2. a. $10 \div \frac{1}{2}$



$10 \div \frac{1}{2} = 20$

b. $\frac{1}{2} \div \frac{1}{6}$



$\frac{1}{2} \div \frac{1}{6} = 3$

3. area of top rectangle: 20 cm × 7 cm = 140 cm^2
area of bottom rectangle: 20 cm × 7 cm = 140 cm^2
area of front rectangle: 20 cm × 8 cm = 160 cm^2
area of back rectangle: 20 cm × 8 cm = 160 cm^2
area of side rectangle: 7 cm × 8 cm = 56 cm^2
area of side rectangle: 7 cm × 8 cm = 56 cm^2
surface area of the rectangular prism:
140 cm^2 + 140 cm^2 + 160 cm^2 + 160 cm^2 + 56 cm^2 + 56 cm^2 = 712 cm^2

4.
$$\begin{array}{r} {\scriptstyle 1\ \ \ \ \ \ } \\ 453 \\ \times\ 0.35 \\ \hline 2265 \\ +13590 \\ \hline 15.855 \end{array}$$

5. a. Half of 5 is $2\frac{1}{2}$. 3 is greater than $2\frac{1}{2}$.
$\frac{3}{5}$ is greater than $\frac{1}{2}$ ⟶ round up
$\frac{3}{5}$ ⟶ 1

b. 9496
round down
9

c. Half of 7 is $3\frac{1}{2}$. 4 is greater than $3\frac{1}{2}$.
$\frac{4}{7}$ is greater than $\frac{1}{2}$ ⟶ round up
$5\frac{4}{7}$ ⟶ 6

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RECIPROCALS

Video Lesson

Left Problem

$\frac{1}{15}$

$15 \times \frac{1}{15} = 1$ or $\frac{1}{15} \times 15 = 1$

$1 \div 15 = \frac{1}{15}$ or $1 \div \frac{1}{15} = 15$

Right Problem

$\frac{3}{2}$

$\frac{2}{3} \times \frac{3}{2} = 1$ or $\frac{3}{2} \times \frac{2}{3} = 1$

$1 \div \frac{2}{3} = \frac{3}{2}$ or $1 \div \frac{3}{2} = \frac{2}{3}$

Practice

1. a. $\frac{3}{2}$

b. $\frac{8}{7}$

c. $\frac{4}{1} = 4$

d. $\frac{6}{5}$

e. $\frac{20}{1} = 20$

f. $\frac{2}{3}$

g. $\frac{5}{6}$

h. $\frac{8}{3}$

2. a. $\frac{1}{4}$

b. $\frac{1}{5}$

c. $\frac{1}{2}$

d. $\frac{1}{8}$

e. $\frac{1}{24}$

f. $\frac{1}{14}$

g. $\frac{1}{9}$

h. $\frac{1}{3}$

3. a. $4\frac{1}{3} = \frac{13}{3}$ $\frac{3}{13}$

b. $2\frac{1}{4} = \frac{9}{4}$ $\frac{4}{9}$

c. $3\frac{2}{5} = \frac{17}{5}$ $\frac{5}{17}$

4. a. $\frac{6}{5}$

b. $\frac{1}{9}$

c. $\frac{5}{8}$

d. $\frac{1}{14}$

e. $\frac{1}{3}$

f. $\frac{4}{5}$

g. $\frac{4}{1} = 4$

h. $\frac{1}{15}$

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5. a. $\frac{\cancel{5}^{1}}{\cancel{12}_{1}} \times \frac{\cancel{12}^{1}}{\cancel{5}_{1}} = 1$

b. $\frac{\cancel{9}^{1}}{\cancel{7}_{1}} \times \frac{\cancel{7}^{1}}{\cancel{9}_{1}} = 1$

6. a. $\frac{4}{3}$

b. $\frac{4}{15}$

c. $\frac{3}{7}$

d. $\frac{1}{4}$

Review

1. a. 8% ⟶ 08% ⟶ 0.08
8% = 0.08

124% ⟶ 124% ⟶ 1.24
124% = 1.24

b. 0.72 ⟶ 0.72 ⟶ 72%
0.72 = 72%

0.09 ⟶ 0.09 ⟶ 9%
0.09 = 9%

2. 9 × 32 =
9 × (30 + 2) =
(9 × 30) + (9 × 2) =
270 + 18 = 288

3.
$$\begin{array}{r} {}^{1}\not{2}^{1} \\ \$0.45 \\ \times \quad 24 \\ \hline 180 \\ +{}^{1}0900 \\ \hline \$10.80 \end{array}$$

4. a. $\frac{14}{25} \times \frac{4}{4} = \frac{56}{100} = 56\%$

b. $\frac{13}{20} \times \frac{5}{5} = \frac{65}{100} = 65\%$

5. a. 5 to 10
divide both terms by 5
$\frac{1}{2}$, 1 : 2

b. 22 to 10
divide both terms by 2
$\frac{11}{5}$, 11 : 5

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DIVIDING FRACTIONS USING RECIPROCALS

Video Lesson

$\frac{3}{5} \div \frac{1}{12} = \frac{3}{5} \times \frac{12}{1} = \frac{36}{5} = 7\frac{1}{5}$

$7\frac{1}{5}$ hours

Practice

1. a. (given)

b. $3 \times \frac{4}{1}$

c. $\frac{5}{6} \times \frac{1}{2}$

d. $7 \times \frac{2}{1}$

e. $\frac{2}{5} \times \frac{1}{3}$

f. $\frac{9}{2} \times \frac{3}{4}$

2. a. $6 \div \frac{2}{3} = 6 \times \frac{3}{2} = \frac{\overset{3}{\cancel{6}}}{1} \times \frac{3}{\underset{1}{\cancel{2}}} = 9$

b. $9 \div \frac{3}{4} = 9 \times \frac{4}{3} = \frac{\overset{3}{\cancel{9}}}{1} \times \frac{4}{\underset{1}{\cancel{3}}} = 12$

c. $3 \div \frac{6}{5} = 3 \times \frac{5}{6} = \frac{\overset{1}{\cancel{3}}}{1} \times \frac{5}{\underset{2}{\cancel{6}}} = \frac{5}{2} = 2\frac{1}{2}$

d. $5 \div \frac{1}{2} = 5 \times 2 = 10$

3. a. $\frac{5}{9} \div 3 = \frac{5}{9} \times \frac{1}{3} = \frac{5}{27}$

b. $\frac{7}{10} \div 5 = \frac{7}{10} \times \frac{1}{5} = \frac{7}{50}$

c. $\frac{4}{3} \div 2 = \frac{4}{3} \times \frac{1}{2} = \frac{\overset{2}{\cancel{4}}}{3} \times \frac{1}{\underset{1}{\cancel{2}}} = \frac{2}{3}$

d. $\frac{6}{5} \div 9 = \frac{6}{5} \times \frac{1}{9} = \frac{\overset{2}{\cancel{6}}}{5} \times \frac{1}{\underset{3}{\cancel{9}}} = \frac{2}{15}$

4. a. $\frac{5}{3} \div \frac{1}{3} = \frac{5}{\underset{1}{\cancel{3}}} \times \frac{\overset{1}{\cancel{3}}}{1} = 5$

b. $\frac{2}{3} \div \frac{1}{4} = \frac{2}{3} \times \frac{4}{1} = \frac{8}{3} = 2\frac{2}{3}$

c. $\frac{4}{5} \div \frac{3}{4} = \frac{4}{5} \times \frac{4}{3} = \frac{16}{15} = 1\frac{1}{15}$

d. $\frac{5}{4} \div \frac{1}{2} = \frac{5}{4} \times \frac{2}{1} = \frac{5}{\underset{2}{\cancel{4}}} \times \frac{\overset{1}{\cancel{2}}}{1} = \frac{5}{2} = 2\frac{1}{2}$

5. Work for each problem is shown on the next page.



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A $\frac{1}{2} \div \frac{1}{3} = \frac{1}{2} \times \frac{3}{1} = \frac{3}{2} = 1\frac{1}{2}$

B $\frac{7}{8} \div \frac{3}{4} = \frac{7}{\cancel{8}_{2}} \times \frac{\cancel{4}^{1}}{3} = \frac{7}{6} = 1\frac{1}{6}$

C $\frac{5}{9} \div \frac{5}{3} = \frac{\cancel{5}^{1}}{\cancel{9}_{3}} \times \frac{\cancel{3}^{1}}{\cancel{5}_{1}} = \frac{1}{3}$

D $3 \div \frac{2}{5} = 3 \times \frac{5}{2} = \frac{3}{1} \times \frac{5}{2} = \frac{15}{2} = 7\frac{1}{2}$

E $10 \div \frac{8}{3} = 10 \times \frac{3}{8} = \frac{10}{1} \times \frac{3}{8} = \frac{\cancel{10}^{5}}{1} \times \frac{3}{\cancel{8}_{4}} = \frac{15}{4} = 3\frac{3}{4}$

F $\frac{1}{4} \div 3 = \frac{1}{4} \times \frac{1}{3} = \frac{1}{12}$

G $\frac{2}{3} \div \frac{1}{7} = \frac{2}{3} \times \frac{7}{1} = \frac{14}{3} = 4\frac{2}{3}$

H $4 \div \frac{5}{6} = 4 \times \frac{6}{5} = \frac{4}{1} \times \frac{6}{5} = \frac{24}{5} = 4\frac{4}{5}$

greater than $\frac{1}{2}$:

$\frac{1}{3}$ and $\frac{1}{12}$ are less than $\frac{1}{2}$.

Cross off $\frac{5}{9} \div \frac{5}{3}$ and $\frac{1}{4} \div 3$.

less than 7:

$7\frac{1}{2}$ is greater than 7. Cross off $3 \div \frac{2}{5}$.

fraction part with a denominator of 3:

$1\frac{1}{2}$, $1\frac{1}{6}$, $3\frac{3}{4}$, and $4\frac{4}{5}$ do not have a fraction part with a denominator of 3. Cross off $\frac{1}{2} \div \frac{1}{3}$, $\frac{7}{8} \div \frac{3}{4}$, $10 \div \frac{8}{3}$, and $4 \div \frac{5}{6}$.

The popcorn piece is $\frac{2}{3} \div \frac{1}{7}$.

Review

1. a. $\frac{5}{3}$

b. $\frac{1}{7}$

2. a. 6,285 ÷ 1,000 = 6.285
6,285 mL = 6.285 L

b. 1 gal = 4 qt
4 × 4 = 16
4 gal = 16 qt

3. a.
$$\begin{array}{r} {\scriptstyle 1}\\ 9.02\\ \times\ 5.3\\ \hline 2706\\ +\ 45100\\ \hline 47.806 \end{array}$$

b. $72.4 \times 10^2 = 72.40 \times 10^2 = 7{,}240$

4. a.
$$\begin{array}{r} {\scriptstyle 4\ 10}\\ \cancel{5}.{\scriptstyle 1}\cancel{1}0\\ -\ 3.24\\ \hline 1.86 \end{array}$$

b. $\frac{2}{7} + \frac{2}{3}$
LCM of 7 and 3: 21
$\frac{2}{7} \times \frac{3}{3} + \frac{2}{3} \times \frac{7}{7}$
$= \frac{6}{21} + \frac{14}{21}$
$= \frac{20}{21}$

5. factors of 28: 1, 2, 4, 7, 14, 28
factors of 42: 1, 2, 3, 6, 7, 14, 21, 42
GCF: 14

6. a. $\frac{4}{6} = \frac{2}{3}$, 2 : 3

b. $\frac{4}{10} = \frac{2}{5}$, 2 : 5

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CIRCLES

Video Lesson

Left Problem

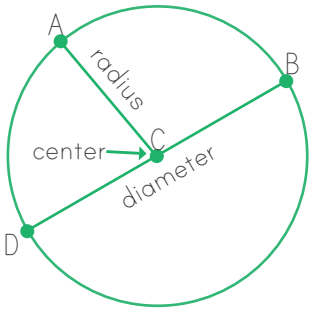
circle name: ⊙X
radius name (possible answers): $\overline{ZX}$, $\overline{XZ}$, $\overline{WX}$, $\overline{XW}$, $\overline{YX}$, or $\overline{XY}$
diameter (possible answers): $\overline{WY}$ or $\overline{YW}$
radius measure: 12 in
diameter measure: 12 in × 2 = 24 in

Right Problem

circle name: ⊙Q
radius name (possible answers): $\overline{RQ}$, $\overline{QR}$, $\overline{SQ}$, $\overline{QS}$, $\overline{TQ}$, or $\overline{QT}$
diameter (possible answers): $\overline{ST}$ or $\overline{TS}$
radius measure: 5 ft ÷ 2 = 2.5 ft or $2\frac{1}{2}$ ft
diameter measure: 5 ft

Practice

1. Answers may vary, but the diameter should be across the circle through the center. A radius should be from the center of the circle to the edge. The circumference is around the whole circle.



2. a. circle: ⊙B
radii (possible answers): $\overline{AB}$, $\overline{BA}$, $\overline{DB}$, $\overline{BD}$, $\overline{CB}$, or $\overline{BC}$
diameter (possible answers): $\overline{AD}$ or $\overline{DA}$

b. circle: ⊙G
radii (possible answers): $\overline{EG}$, $\overline{GE}$, $\overline{HG}$, $\overline{GH}$, $\overline{FG}$, or $\overline{GF}$
diameter (possible answers): $\overline{EH}$ or $\overline{HE}$

c. circle: ⊙K
radii (possible answers): $\overline{JK}$, $\overline{KJ}$, $\overline{MK}$, $\overline{KM}$, $\overline{LK}$, or $\overline{KL}$
diameter (possible answers): $\overline{JM}$ or $\overline{MJ}$

3. a. 18 m ÷ 2 = 9 m

b. 50 in ÷ 2 = 25 in

c. 48 yd ÷ 2 = 24 yd

4. a. 8 in × 2 = 16 in

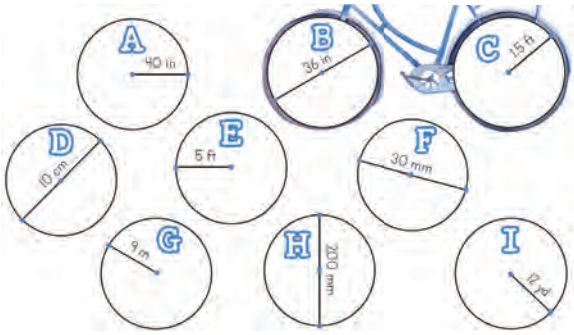
b. 4.3 ft × 2 = 8.6 ft

c. 22 m × 2 = 44 m

5. a. radius = 42 m ÷ 2 = 21 m
diameter = 42 m

b. radius = 9 ft
diameter = 9 ft × 2 = 18 ft

6. Work for each problem is shown on the next page.



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A radius = 40 in
diameter = 40 in × 2 = 80 in

B radius = 36 in ÷ 2 = 18 in
diameter = 36 in

C radius = 1.5 ft
diameter = 1.5 ft × 2 = 3 ft

D radius = 10 cm ÷ 2 = 5 cm
diameter = 10 cm

E radius = 5 ft
diameter = 5 ft × 2 = 10 ft

F radius = 30 mm ÷ 2 = 15 mm
diameter = 30 mm

G radius = 9 m
diameter = 9 m × 2 = 18 m

H radius = 200 mm ÷ 2 = 100 mm
diameter = 200 mm

I radius = 12 yd
diameter = 12 yd × 2 = 24 yd

a. E

b. 15 mm

c. G

d. 12 in = 1 ft
18 ÷ 12 = 1.5
18 in = 1.5 ft
B and C

e. 36 in and 3 ft

f. 1 ft = 12 in
3 × 12 = 36
3 ft = 36 in
yes

g. 100 mm

h. 80 in

Review

1. a. $5 \div \frac{5}{7} = 5 \times \frac{7}{5} = \frac{\cancel{5}^{1}}{1} \times \frac{7}{\cancel{5}_{1}} = 7$

b. $\frac{2}{3} \div \frac{1}{4} = \frac{2}{3} \times \frac{4}{1} = \frac{8}{3} = 2\frac{2}{3}$

2.

Time	Interval	
5:38 PM	end time	
5:38 AM	12 hr	] 14 hr
3:38 AM	2 hr	
3:16 AM	22 min	] 22 min

start time: 3:16 AM

3. $21\overline{)2,838}$ $= 135\frac{3}{21} = 135\frac{1}{7}$

-21
73
-63
108
-105
3

4. a. $1^9 = 1 \times 1 \times 1 \times 1 \times 1 \times 1 \times 1 \times 1 \times 1 = 1$

b. $29^0 = 1$

c. $3^4 = 3 \times 3 \times 3 \times 3 = 81$

5. $8^2 - (4 \times 3) + 5 =$
$64 - (4 \times 3) + 5 =$
$64 - 12 + 5 =$
$52 + 5 =$
57

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CIRCUMFERENCE AND AREA OF CIRCLES

Video Lesson

Top Left Box

$C = \pi d$
$C \approx 3.14 \times 16$ in
$C \approx 50.24$ in

Bottom Left Box

$A = \pi r^2$
$A \approx 3.14 \times (8 \text{ in})^2$
$A \approx 3.14 \times (8 \text{ in} \times 8 \text{ in})$
$A \approx 3.14 \times 64 \text{ in}^2$
$A \approx 200.96 \text{ in}^2$

Top Right Box

$C = 2\pi r$
$C \approx 2 \times 3.14 \times 7$ in
$C \approx 3.14 \times 14$ in
$C \approx 43.96$ in

Bottom Right Box

$A = \pi r^2$
$A \approx 3.14 \times (7 \text{ in})^2$
$A \approx 3.14 \times (7 \text{ in} \times 7 \text{ in})$
$A \approx 3.14 \times 49 \text{ in}^2$
$A \approx 153.86 \text{ in}^2$

Practice

1. a. radius

b. circumference

c. diameter

d. radius

e. $C = \pi d$, $C = 2\pi r$

f. $A = \pi r^2$

g. 3.14, π

2. a. $C = \pi d$
$C \approx 3.14 \times 1$ ft
$C \approx 3.14$ ft

b. $C = \pi d$
$C \approx 3.14 \times 4$ cm
$C \approx 12.56$ cm

3. a. $C = 2\pi r$
$C \approx 2 \times 3.14 \times 8$ km
$C \approx 3.14 \times 16$ km
$C \approx 50.24$ km

b. $C = 2\pi r$
$C \approx 2 \times 3.14 \times 2$ m
$C \approx 3.14 \times 4$ m
$C \approx 12.56$ m

4. a. $A = \pi r^2$
$A \approx 3.14 \times (3 \text{ ft})^2$
$A \approx 3.14 \times (3 \text{ ft} \times 3 \text{ ft})$
$A \approx 3.14 \times 9 \text{ ft}^2$
$A \approx 28.26 \text{ ft}^2$

b. $A = \pi r^2$
$A \approx 3.14 \times (6 \text{ m})^2$
$A \approx 3.14 \times (6 \text{ m} \times 6 \text{ m})$
$A \approx 3.14 \times 36 \text{ m}^2$
$A \approx 113.04 \text{ m}^2$

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c. $A = \pi r^2$
$A \approx 3.14 \times (1 \text{ mi})^2$
$A \approx 3.14 \times (1 \text{ mi} \times 1 \text{ mi})$
$A \approx 3.14 \times 1 \text{ mi}^2$
$A \approx 3.14 \text{ mi}^2$

5. a. radius = 4 cm
diameter = 8 cm

$C = \pi d$
$C \approx 3.14 \times 8 \text{ cm}$
$C \approx 25.12 \text{ cm}$
circumference ≈ 25.12 cm

$A = \pi r^2$
$A \approx 3.14 \times (4 \text{ cm})^2$
$A \approx 3.14 \times (4 \text{ cm} \times 4 \text{ cm})$
$A \approx 3.14 \times 16 \text{ cm}^2$
$A \approx 50.24 \text{ cm}^2$
area ≈ 50.24 cm^2

b. radius = 5 in
diameter = 10 in

$C = \pi d$
$C \approx 3.14 \times 10 \text{ in}$
$C \approx 31.4 \text{ in}$
circumference ≈ 31.4 in

$A = \pi r^2$
$A \approx 3.14 \times (5 \text{ in})^2$
$A \approx 3.14 \times (5 \text{ in} \times 5 \text{ in})$
$A \approx 3.14 \times 25 \text{ in}^2$
$A \approx 78.5 \text{ in}^2$
area ≈ 78.5 in^2

c. radius = 10 cm
diameter = 20 cm

$C = \pi d$
$C \approx 3.14 \times 20 \text{ cm}$
$C \approx 62.8 \text{ cm}$
circumference ≈ 62.8 cm

$A = \pi r^2$
$A \approx 3.14 \times (10 \text{ cm})^2$
$A \approx 3.14 \times (10 \text{ cm} \times 10 \text{ cm})$
$A \approx 3.14 \times 100 \text{ cm}^2$
$A \approx 314 \text{ cm}^2$
area ≈ 314 cm^2

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Review

1. 30: 30 is even, so 30 is divisible by 2.
3 + 0 = 3 3 is divisible by 3, so 30 is divisible by 3.
30 ends in 0, so 30 is divisible by 5.

45: 45 is odd, so 45 is not divisible by 2.

180: 180 is even, so 180 is divisible by 2.
1 + 8 + 0 = 9 9 is divisible by 3, so 180 is divisible by 3.
180 ends in 0, so 180 is divisible by 5.

500: 500 is even, so 500 is divisible by 2.
5 + 0 + 0 = 5 5 is not divisible by 3, so 500 is not divisible by 3.

720: 720 is even, so 720 is divisible by 2.
7 + 2 + 0 = 9 9 is divisible by 3, so 720 is divisible by 3.
720 ends in 0, so 720 is divisible by 5.

(30) 45 (180) 500 (720)

2. a. $\frac{1}{2}$

b. $\frac{3}{4}$

3. a. $0.8213 \times 10^3 = 0.8213 \times 10^3 = 821.3$

b. $9{,}420.5 \div 10^3 = 9.420.5 \div 10^3 = 9.4205$

4. a. $\frac{3}{10} \times \frac{10}{10} = \frac{30}{100} = 30\%$

b. $0.05 \longrightarrow 0.05\% \longrightarrow 5\%$

5. 7.904 is the least
Compare the tenths place:
79.04 ⟵ next smallest
79.4
79.44

Compare the hundredths place:
79.40
79.44 ⟵ greatest

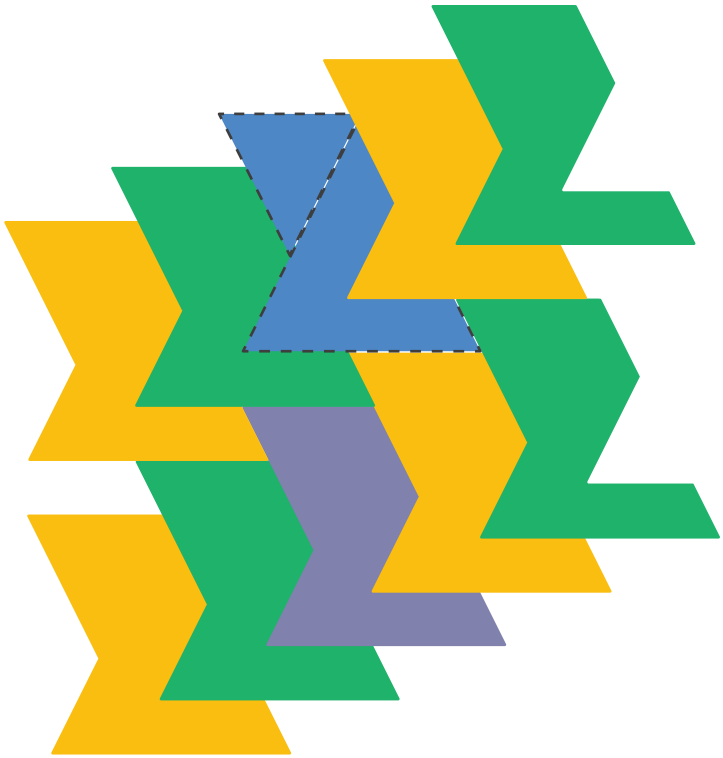
Least to greatest:
7.904, 79.04, 79.4, 79.44

6.
$$\begin{array}{r} {\scriptstyle 1}\quad\quad {\scriptstyle 1} \\ 9.6093 \\ {\scriptstyle 1}0.4230 \\ +\,10.0061 \\ \hline 20.0384 \end{array}$$

TESSELLATIONS

Practice

For Problems 1 and 2, student tessellations will vary. An example tessellation is shown below.



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UNIT 3 REVIEW: KAYAKING AT THE CANYON

Practice

1.

Time	Interval	
4:38 AM	start time	
4:38 PM	12 hr	] 15 hr
7:38 PM	3 hr	
8:00 PM	22 min	] 32 min
8:10 PM	10 min	

elapsed time: 15 hr 32 min

2. a. $8\overline{)41}$ = $5\frac{1}{8}$

-40

1

b. $\frac{33}{7} = \frac{7}{7} + \frac{7}{7} + \frac{7}{7} + \frac{7}{7} + \frac{5}{7} = 4\frac{5}{7}$

c. $8\frac{9}{10}$

$\frac{8 \times 10 + 9}{10} = \frac{80 + 9}{10} = \frac{89}{10}$

d. $8\frac{3}{4}$

$\frac{8 \times 4 + 3}{4} = \frac{32 + 3}{4} = \frac{35}{4}$

3.



4. $6 \times 48 = 6 \times (40 + 8) = (6 \times 40) + (6 \times 8)$
$= 240 + 48 = 288$

288 minutes

5. a. 0.42 → 0.42% → 42%

b. 0.07 → 0.07% → 7%

c. 28% → 28% → 0.28

d. 400% → 400% → 4

6. a. $\frac{7}{20} \times \frac{5}{5} = \frac{35}{100} = 35\%$

b. $\frac{13}{25} \times \frac{4}{4} = \frac{52}{100} = 52\%$

7. a. $52 \times 1{,}000 = 52{,}000$
52 L = 52,000 mL

b. 1 gal = 4 qt
$6 \times 4 = 24$
6 gal = 24 qt

c. 2 c = 1 pt
$18 \div 2 = 9$
18 c = 9 pt

d. 8 fl oz = 1 c
$40 \div 8 = 5$
40 fl oz = 5 c

8. a. $\frac{\overset{1}{\cancel{3}}}{4} \times \frac{7}{\cancel{9}_{3}} = \frac{7}{12}$

b. $\frac{\overset{1}{\cancel{5}}}{\cancel{8}_{2}} \times \frac{\overset{1}{\cancel{4}}}{\cancel{15}_{\cancel{3}_{1}}} \times \frac{\overset{1}{\cancel{3}}}{2} = \frac{1}{4}$

9. a. $8 \times \frac{3}{4} = \frac{\overset{2}{\cancel{8}}}{1} \times \frac{3}{\cancel{4}_{1}} = \frac{6}{1} = 6$

b. $\frac{9}{10} \times 5 = \frac{9}{10} \times \frac{5}{1} = \frac{9}{\cancel{10}_{2}} \times \frac{\overset{1}{\cancel{5}}}{1} = \frac{9}{2} = 4\frac{1}{2}$

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10. a. $28.013 \times 10^2 = 28.013 \times 10^2 = 2{,}801.3$

b. $4.2902 \times 10^4 = 4.2902 \times 10^4 = 42{,}902$

11. a.
$$\begin{array}{r} {\scriptstyle 4}\\ 3.6\\ \times\ 0.7\\ \hline 2.52 \end{array}$$
(2 decimal places)

b.
$$\begin{array}{r} {\scriptstyle 17}\\ 1.008\\ \times\ \ 9.2\\ \hline 2016\\ +90720\\ \hline 9.2736 \end{array}$$
(4 decimal places)

12. a. $367.6 \div 10^3 = 367.6 \div 10^3 = 0.3676$

b. $124.3 \div 10^2 = 124.3 \div 10^2 = 1.243$

13. a. $9 \div \frac{3}{2} = 9 \times \frac{2}{3} = \frac{\overset{3}{\cancel{9}}}{1} \times \frac{2}{\underset{1}{\cancel{3}}} = \frac{6}{1} = 6$

b. $\frac{3}{7} \div \frac{9}{7} = \frac{\overset{1}{\cancel{3}}}{\underset{1}{\cancel{7}}} \times \frac{\overset{1}{\cancel{7}}}{\underset{3}{\cancel{9}}} = \frac{1}{3}$

14. a. $\frac{1}{2} + \frac{2}{3}$
$= \frac{1}{2} \times \frac{3}{3} + \frac{2}{3} \times \frac{2}{2}$
$= \frac{3}{6} + \frac{4}{6}$
$= \frac{7}{6}$
$= 1\frac{1}{6}$

b. $6\frac{2}{3} + 2\frac{1}{4}$
$= 6\frac{2}{3} \times \frac{4}{4} + 2\frac{1}{4} \times \frac{3}{3}$
$= 6\frac{8}{12} + 2\frac{3}{12}$
$= 8\frac{11}{12}$

c. $\frac{5}{6} - \frac{4}{9}$
$= \frac{5}{6} \times \frac{3}{3} - \frac{4}{9} \times \frac{2}{2}$
$= \frac{15}{18} - \frac{8}{18}$
$= \frac{7}{18}$

15. a.
$$\begin{array}{r} {\scriptstyle 4\ \ 9}\\ \cancel{5}\cancel{.}\cancel{0}0\\ -\ 3.0\,6\\ \hline 1.9\,4 \end{array}$$

b.
$$\begin{array}{r} {\scriptstyle 7}\\ 9\cancel{.}\cancel{0}0\\ -\ 0.1\,5\\ \hline 9.6\,5 \end{array}$$

16. 8: 1, 2, 4, 8
20: 1, 2, 4, 5, 10, 20
GCF: 4

17. a. Half of 20 is 10. 11 is greater than 10.
$\frac{11}{20}$ is greater than $\frac{1}{2}$ $\longrightarrow$ round up
$\frac{11}{20} \longrightarrow 1$

b. Half of 7 is $3\frac{1}{2}$. 3 is less than $3\frac{1}{2}$.
$\frac{3}{7}$ is less than $\frac{1}{2}$ $\longrightarrow$ round down
$2\frac{3}{7} \longrightarrow 2$

c. $\frac{23}{6} = 3\frac{5}{6}$
Half of 6 is 3. 5 is greater than 3.
$\frac{5}{6}$ is greater than $\frac{1}{2}$ $\longrightarrow$ round up
$3\frac{5}{6} \longrightarrow 4$

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18. area of top rectangle: $5 \text{ m} \times 16 \text{ m} = 80 \text{ m}^2$
area of bottom rectangle: $5 \text{ m} \times 16 \text{ m} = 80 \text{ m}^2$
area of small front rectangle: $5 \text{ m} \times 3 \text{ m} = 15 \text{ m}^2$
area of small back rectangle: $5 \text{ m} \times 3 \text{ m} = 15 \text{ m}^2$
area of large side rectangle: $16 \text{ m} \times 3 \text{ m} = 48 \text{ m}^2$
area of large side rectangle: $16 \text{ m} \times 3 \text{ m} = 48 \text{ m}^2$

surface area of the rectangular prism:
$80 \text{ m}^2 + 80 \text{ m}^2 + 15 \text{ m}^2 + 15 \text{ m}^2 + 48 \text{ m}^2 + 48 \text{ m}^2 = 286 \text{ m}^2$

19. circumference: $C = \pi d$ or $C = 2\pi r$
area: $A = \pi r^2$

radius = 11 ft
diameter = 22 ft

$C = \pi d$
$C \approx 3.14 \times 22 \text{ ft}$
$C \approx 69.08 \text{ ft}$
circumference $\approx 69.08 \text{ ft}$

$A = \pi r^2$
$A \approx 3.14 \times (11 \text{ ft})^2$
$A \approx 3.14 \times (11 \text{ ft} \times 11 \text{ ft})$
$A \approx 3.14 \times 121 \text{ ft}^2$
$A \approx 379.94 \text{ ft}^2$
area $\approx 379.94 \text{ ft}^2$

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UNIT ASSESSMENT

Converting Between Improper Fractions & Mixed Numbers

1. a. $4\overline{)21}$ $= 5\frac{1}{4}$

$\begin{array}{r} -20 \\ \hline 1 \end{array}$

b. $2\overline{)15}$ $= 7\frac{1}{2}$

$\begin{array}{r} -14 \\ \hline 1 \end{array}$

2. a. $4\frac{2}{5}$

$\frac{4 \times 5 + 2}{5} = \frac{20 + 2}{5} = \frac{22}{5}$

b. $5\frac{9}{10}$

$\frac{5 \times 10 + 9}{10} = \frac{50 + 9}{10} = \frac{59}{10}$

Converting Between Improper Fractions & Mixed Numbers Additional Practice

1. a. $5\overline{)32}$ $= 6\frac{2}{5}$

$\begin{array}{r} -30 \\ \hline 2 \end{array}$

b. $6\overline{)21}$ $= 3\frac{3}{6} = 3\frac{1}{2}$

$\begin{array}{r} -18 \\ \hline 3 \end{array}$

2. a. $1\frac{4}{5}$

$\frac{1 \times 5 + 4}{5} = \frac{5 + 4}{5} = \frac{9}{5}$

b. $9\frac{2}{3}$

$\frac{9 \times 3 + 2}{3} = \frac{27 + 2}{3} = \frac{29}{3}$

Greatest Common Factor

1. 18: 1, 2, 3, 6, (9) 18
27: 1, 3, (9) 27

GCF of 18 & 27: 9

Greatest Common Factor Additional Practice

1. 12: 1, 2, 3, 4, (6) 12
30: 1, 2, 3, 5, (6) 10, 15, 30

GCF of 12 & 30: 6

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Using the LCM to Find Common Denominators

1. a. multiples of 3: 3, 6, 9, 12, 15
multiples of 2: 2, 4, 6, 8, 10

$\frac{1}{3} = \frac{2}{6}$ $\frac{1}{2} = \frac{3}{6}$

$\frac{1}{3} + \frac{1}{2} = \frac{2}{6} + \frac{3}{6} = \frac{5}{6}$

b. multiples of 4: 4, 8, 12, 16, 20
multiples of 5: 5, 10, 15, 20, 25

$\frac{3}{4} = \frac{15}{20}$ $\frac{1}{5} = \frac{4}{20}$

$\frac{3}{4} - \frac{1}{5} = \frac{15}{20} - \frac{4}{20} = \frac{11}{20}$

Using the LCM to Find Common Denominators Additional Practice

1. a. multiples of 6: 6, 12, 18, 24, 30
multiples of 8: 8, 16, 24, 32, 40

$\frac{5}{6} = \frac{20}{24}$ $\frac{1}{8} = \frac{3}{24}$

$\frac{5}{6} + \frac{1}{8} = \frac{20}{24} + \frac{3}{24} = \frac{23}{24}$

b. multiples of 10: 10, 20, 30, 40, 50
multiples of 5: 5, 10, 15, 20, 25

$\frac{9}{10} = \frac{9}{10}$ $\frac{2}{5} = \frac{4}{10}$

$\frac{9}{10} - \frac{2}{5} = \frac{9}{10} - \frac{4}{10} = \frac{5}{10} = \frac{1}{2}$

Converting Fractions to Percents

1. a. $\frac{7}{10} \times \frac{10}{10} = \frac{70}{100} = 70\%$

b. $\frac{3}{20} \times \frac{5}{5} = \frac{15}{100} = 15\%$

c. $\frac{3}{4} \times \frac{25}{25} = \frac{75}{100} = 75\%$

Converting Fractions to Percents Additional Practice

1. a. $\frac{3}{5} \times \frac{20}{20} = \frac{60}{100} = 60\%$

b. $\frac{22}{25} \times \frac{4}{4} = \frac{88}{100} = 88\%$

c. $\frac{43}{50} \times \frac{2}{2} = \frac{86}{100} = 86\%$

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Rounding to the Nearest Whole Number

1. a. Half of 10 is 5. 3 is less than 5.

$\frac{3}{10}$ is less than $\frac{1}{2}$ ⟶ round down

$\frac{3}{10}$ ⟶ 0

b. Half of 20 is 10. 9 is less than 10.

$\frac{9}{20}$ is less than $\frac{1}{2}$ ⟶ round down

$11\frac{9}{20}$ ⟶ 11

c. $\frac{37}{5} = 7\frac{2}{5}$

Half of 5 is $2\frac{1}{2}$. 2 is less than $2\frac{1}{2}$.

$\frac{2}{5}$ is less than $\frac{1}{2}$ ⟶ round down

$7\frac{2}{5}$ ⟶ 7

Rounding to the Nearest Whole Number Additional Practice

1. a. Half of 5 is $2\frac{1}{2}$. 2 is less than $2\frac{1}{2}$.

$\frac{2}{5}$ is less than $\frac{1}{2}$ ⟶ round down

$\frac{2}{5}$ ⟶ 0

b. Half of 7 is $3\frac{1}{2}$. 3 is less than $3\frac{1}{2}$.

$\frac{3}{7}$ is less than $\frac{1}{2}$ ⟶ round down

$5\frac{3}{7}$ ⟶ 5

c. $\frac{7}{2} = 3\frac{1}{2}$

$\frac{1}{2}$ ⟶ round up

$3\frac{1}{2}$ ⟶ 4

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Multiplying Fractions by Whole Numbers

1. a. $8 \times \frac{5}{4} = \frac{8}{1} \times \frac{5}{4} = \frac{\overset{2}{\cancel{8}}}{1} \times \frac{5}{\underset{1}{\cancel{4}}} = \frac{10}{1} = 10$

b. $\frac{4}{3} \times 6 = \frac{4}{3} \times \frac{6}{1} = \frac{4}{\underset{1}{\cancel{3}}} \times \frac{\overset{2}{\cancel{6}}}{1} = \frac{8}{1} = 8$

Multiplying Fractions by Whole Numbers Additional Practice

1. a. $3 \times \frac{9}{10} = \frac{3}{1} \times \frac{9}{10} = \frac{27}{10} = 2\frac{7}{10}$

b. $\frac{3}{5} \times 10 = \frac{3}{\underset{1}{\cancel{5}}} \times \frac{\overset{2}{\cancel{10}}}{1} = \frac{6}{1} = 6$

Canceling Before Multiplying Fractions

1. a. $\frac{\overset{1}{\cancel{2}}}{5} \times \frac{3}{\underset{2}{\cancel{4}}} = \frac{3}{10}$

b. $\frac{\overset{1}{\cancel{2}}}{\underset{1}{\cancel{3}}} \times \frac{\overset{1}{\cancel{3}}}{5} \times \frac{1}{\underset{2}{\cancel{4}}} = \frac{1}{10}$

Canceling Before Multiplying Fractions Additional Practice

1. a. $\frac{\overset{1}{\cancel{4}}}{\underset{3}{\cancel{9}}} \times \frac{\overset{1}{\cancel{3}}}{\underset{1}{\cancel{4}}} = \frac{1}{3}$

b. $\frac{\overset{1}{\cancel{2}}}{5} \times \frac{\overset{1}{\cancel{3}}}{\underset{1}{\cancel{14}}} \times \frac{\overset{1}{\cancel{7}}}{\underset{3}{\cancel{9}}} = \frac{1}{15}$

Surface Area of Geometric Solids

1. area of top square: 8 cm × 8 cm = 64 cm^2
area of bottom square: 8 cm × 8 cm = 64 cm^2
area of front rectangle: 8 cm × 11 cm = 88 cm^2
area of back rectangle: 8 cm × 11 cm = 88 cm^2
area of side rectangle 1: 8 cm × 11 cm = 88 cm^2
area of side rectangle 2: 8 cm × 11 cm = 88 cm^2

surface area of the rectangular prism: 64 cm^2 + 64 cm^2 + 88 cm^2 + 88 cm^2 + 88 cm^2 + 88 cm^2 = 480 cm^2

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Surface Area of Geometric Solids Additional Practice

1. area of bottom square: $6 \text{ in} \times 6 \text{ in} = 36 \text{ in}^2$

   area of front triangle: $\frac{6 \text{ in} \times 9 \text{ in}}{2} = \frac{54 \text{ in}^2}{2} = 27 \text{ in}^2$

   area of back triangle: $\frac{6 \text{ in} \times 9 \text{ in}}{2} = \frac{54 \text{ in}^2}{2} = 27 \text{ in}^2$

   area of side triangle 1: $\frac{6 \text{ in} \times 9 \text{ in}}{2} = \frac{54 \text{ in}^2}{2} = 27 \text{ in}^2$

   area of side triangle 2: $\frac{6 \text{ in} \times 9 \text{ in}}{2} = \frac{54 \text{ in}^2}{2} = 27 \text{ in}^2$

   surface area of the square pyramid: $36 \text{ in}^2 + 27 \text{ in}^2 + 27 \text{ in}^2 + 27 \text{ in}^2 + 27 \text{ in}^2 = 144 \text{ in}^2$

Ratios

1. a. hearts to stars: 4 to 6
   divide both terms by 2
   $\frac{2}{3}$ 2 : 3

   b. stars to hearts:
   $\frac{3}{2}$ 3 : 2

   c. total to hearts: 10 to 4
   divide both terms by 2
   $\frac{5}{2}$ 5 : 2

   d. stars to total: 6 to 10
   divide both terms by 2
   $\frac{3}{5}$ 3 : 5

Ratios Additional Practice

1. a. ovals to triangles: 3 to 6
   divide both terms by 3
   $\frac{1}{2}$ 1 : 2

   b. triangles to total: 6 to 9
   divide both terms by 3
   $\frac{2}{3}$ 2 : 3

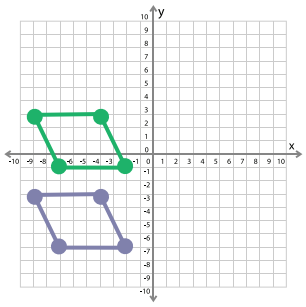
   c. total to triangles: 9 to 6
   divide both terms by 3
   $\frac{3}{2}$ 3 : 2

   d. ovals to total: 3 to 9
   divide both terms by 3
   $\frac{1}{3}$ 1 : 3

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Graphing & Transformations

1. a.

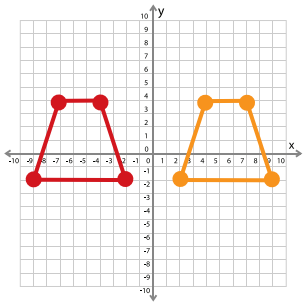


b. parallelogram

c. (-9, 3) (-4, 3)
(-2, -1) (-7, -1)

Graphing & Transformations Additional Practice

1. a.



b. trapezoid

c. (4, 4) (7, 4)
(9, -2) (2, -2)

Using Zeros to Subtract Decimal Numbers

1. a.
$$\begin{array}{r} {}^{7}\not{8}.{}^{1}0 \\ -\ 3.7 \\ \hline 4.3 \end{array}$$

b.
$$\begin{array}{r} {}^{3}\ \ \ {}^{1}\ \\ 9.2\not{4}0 \\ -6.105 \\ \hline 3.135 \end{array}$$

Using Zeros to Subtract Decimal Numbers Additional Practice

1. a.
$$\begin{array}{r} {}^{9}\ \ {}^{1}\ {}^{1}\ \\ \not{1}\not{0}.{}^{1}0 \\ -\ \ 5.3 \\ \hline 4.7 \end{array}$$

b.
$$\begin{array}{r} {}^{6}\ {}^{7}\ \ \ \\ \not{7}.0\not{8}0 \\ -1.254 \\ \hline 5.826 \end{array}$$

Using the Distributive Property

1. a. $9 \times 16 = 9 \times (10 + 6) = (9 \times 10) + (9 \times 6) = 90 + 54 = 144$

b. $28 \times 7 = (20 + 8) \times 7 = (20 \times 7) + (8 \times 7) = 140 + 56 = 196$

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Using the Distributive Property Additional Practice

1. a. $9 \times 34 = 9 \times (30 + 4) = (9 \times 30) + (9 \times 4) = 270 + 36 = 306$

   b. $52 \times 7 = (50 + 2) \times 7 = (50 \times 7) + (2 \times 7) = 350 + 14 = 364$

Multiplying & Dividing Decimal Numbers by Powers of 10

1. a. $3.72 \times 10^4 = 3.7200 \times 10^4 = 37{,}200$

   b. $15.628 \div 10^3 = 015.628 \div 10^3 = 0.015628$

Multiplying & Dividing Decimal Numbers by Powers of 10 Additional Practice

1. a. $0.4955 \times 10^2 = 0.4955 \times 10^2 = 49.55$

   b. $3{,}517.4 \div 10^3 = 3.517.4 \div 10^3 = 3.5174$

Multiplying Decimal Numbers

1. a.
$$\begin{array}{r} {\scriptstyle 1}1.2 \\ \times\ 8.3 \\ \hline 36 \\ +960 \\ \hline 9.96 \end{array}$$
(2 decimal places)

b.
$$\begin{array}{r} {\scriptstyle 2\ 1}14.3 \\ \times\ 0.6 \\ \hline 8.58 \end{array}$$
(2 decimal places)

Multiplying Decimal Numbers Additional Practice

1. a.
$$\begin{array}{r} {\scriptstyle 1\ \not{2}}1.5 \\ \times\ 3.4 \\ \hline {\scriptstyle 1}60 \\ +\ 450 \\ \hline 5.10 \end{array}$$
(2 decimal places)

b.
$$\begin{array}{r} {\scriptstyle 5}10.8 \\ \times\ 0.7 \\ \hline 7.56 \end{array}$$
(2 decimal places)

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Time/Elapsed Time

1.

Time	Interval	
5:52 AM	start time	
5:52 PM	12 hr	] 14 hr
7:52 PM	2 hr	
8:00 PM	8 min	] 18 min
8:10 PM	10 min	

end time: 8:10 PM

Time/Elapsed Time Additional Practice

1.

Time	Interval	
6:55 AM	start time	
6:55 PM	12 hr	] 16 hr
10:55 PM	4 hr	
11:00 PM	5 min	] 29 min
11:24 PM	24 min	

elapsed time: 16 hr 29 min

Converting Units of Capacity

1. a. 2 × 1,000 = 2,000
   2 L = 2,000 mL

   b. 7,345 ÷ 1,000 = 7.345
   7,345 mL = 7.345 L

   c. 1 gal = 4 qt
   3 × 4 = 12
   3 gal = 12 qt

   d. 2 pt = 1 qt
   8 ÷ 2 = 4
   8 pt = 4 qt

   e. 2 c = 1 pt
   12 ÷ 2 = 6
   12 c = 6 pt

   f. 8 fl oz = 1 c
   16 ÷ 8 = 2
   16 fl oz = 2 c

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Converting Units of Capacity Additional Practice

I.

a. 3 × 1,000 = 3,000
3 L = 3,000 mL

b. 4,850 ÷ 1,000 = 4.850
4,850 mL = 4.85 L

c. 1 gal = 4 qt
2 × 4 = 8
2 gal = 8 qt

d. 8 pt = 1 gal
16 ÷ 8 = 2
16 pt = 2 gal

e. 4 c = 1 qt
12 ÷ 4 = 3
12 c = 3 qt

f. 8 fl oz = 1 c

Converting Between Decimal Numbers & Percents

I.

a. 0.53 ⟶ 0.53% ⟶ 53%
0.53 = 53%

b. 0.04 ⟶ 0.04% ⟶ 4%
0.04 = 4%

c. 1.69 ⟶ 1.69% ⟶ 169%
1.69 = 169%

d. 75% ⟶ 75% ⟶ 0.75
75% = 0.75

e. 124% ⟶ 124% ⟶ 1.24
124% = 1.24

f. 3% ⟶ 03% ⟶ 0.03
3% = 0.03

Converting Between Decimal Numbers & Percents Additional Practice

I.

a. 0.37 ⟶ 0.37% ⟶ 37%
0.37 = 37%

b. 0.01 ⟶ 0.01% ⟶ 1%
0.01 = 1%

c. 2.06 ⟶ 2.06% ⟶ 206%
2.06 = 206%

d. 9% ⟶ 09% ⟶ 0.09
9% = 0.09

e. 58% ⟶ 58% ⟶ 0.58
58% = 0.58

f. 142% ⟶ 142% ⟶ 1.42
142% = 1.42

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Division with Fractions/Using Reciprocals to Divide

1. a. $4 \div \frac{2}{3} = \frac{4}{1} \div \frac{2}{3} = \frac{\overset{2}{\cancel{4}}}{1} \times \frac{3}{\underset{1}{\cancel{2}}} = 6$

   b. $\frac{6}{5} \div 2 = \frac{6}{5} \div \frac{2}{1} = \frac{\overset{3}{\cancel{6}}}{5} \times \frac{1}{\underset{1}{\cancel{2}}} = \frac{3}{5}$

   c. $\frac{3}{5} \div \frac{1}{2} = \frac{3}{5} \times \frac{2}{1} = \frac{6}{5} = 1\frac{1}{5}$

Division with Fractions/Using Reciprocals to Divide Additional Practice

1. a. $5 \div \frac{5}{8} = \frac{5}{1} \div \frac{5}{8} = \frac{\overset{1}{\cancel{5}}}{1} \times \frac{8}{\underset{1}{\cancel{5}}} = 8$

   b. $\frac{3}{4} \div \frac{1}{5} = \frac{3}{4} \times \frac{5}{1} = \frac{15}{4} = 3\frac{3}{4}$

   c. $\frac{9}{5} \div 3 = \frac{9}{5} \div \frac{3}{1} = \frac{\overset{3}{\cancel{9}}}{5} \times \frac{1}{\underset{1}{\cancel{3}}} = \frac{3}{5}$

Circles/Circumference & Area of Circles

1. circle: $\odot C$
   radii (students had to list three of the following): $\overline{AC}$, $\overline{CA}$, $\overline{BC}$, $\overline{CB}$, $\overline{CD}$, or $\overline{DC}$
   diameter (students had to list one of the following): $\overline{AD}$ or $\overline{DA}$

2. radius = 10 cm ÷ 2 = 5 cm
   diameter = 10 cm

   $C = \pi d$
   $C \approx 3.14 \times 10$ cm
   $C \approx 31.4$ cm
   circumference ≈ 31.4 cm

   $A = \pi r^2$
   $A \approx 3.14 \times (5 \text{ cm})^2$
   $A \approx 3.14 \times (5 \text{ cm} \times 5 \text{ cm})$
   $A \approx 3.14 \times 25 \text{ cm}^2$
   $A \approx 78.5 \text{ cm}^2$
   area ≈ 78.5 cm^2

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Circles/Circumference & Area of Circles Additional Practice

1. circle: $\odot F$
radii (students had to list three of the following): $\overline{EF}$, $\overline{FE}$, $\overline{FG}$, $\overline{GF}$, $\overline{FH}$, or $\overline{HF}$
diameter (students had to list one of the following): $\overline{EH}$ or $\overline{HE}$

2. radius = 7 in
diameter = 7 in × 2 = 14 in

$C = \pi d$
$C \approx 3.14 \times 14$ in
$C \approx 43.96$ in
circumference ≈ 43.96 in

$A = \pi r^2$
$A \approx 3.14 \times (7 \text{ in})^2$
$A \approx 3.14 \times (7 \text{ in} \times 7 \text{ in})$
$A \approx 3.14 \times 49 \text{ in}^2$
$A \approx 153.86 \text{ in}^2$
area ≈ 153.86 in^2

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DIVIDING DECIMAL NUMBERS BY WHOLE NUMBERS

Video Lesson

Left Problem

$$
\begin{array}{r}
15.13 \\
5\overline{)75.65} \\
-5 \\
\hline
25 \\
-25 \\
\hline
06 \\
-\ 5 \\
\hline
15 \\
-15 \\
\hline
0
\end{array}
$$

$15.13

Middle Problem

$$
\begin{array}{r}
7.18 \\
4\overline{)28.^{3}72}
\end{array}
$$

$7.18

Right Problem

$$
\begin{array}{r}
2.06 \\
8\overline{)16.48} \\
-16 \\
\hline
04 \\
-\ 0 \\
\hline
48 \\
-48 \\
\hline
0
\end{array}
$$

$2.06

Practice

1. a. $3\overline{)15.5^{2}1}$ → 5.17

b. $25\overline{)26^{1}2.5}$ → 10.5

c. $8\overline{)0.0816}$ → 0.0102

2. a. $4\overline{)92.8}$ → 23.2

$$
\begin{array}{r}
-8 \\
\hline
12 \\
-12 \\
\hline
08 \\
-\ 8 \\
\hline
0
\end{array}
$$

b. $3\overline{)0.0465}$ → 0.0155

$$
\begin{array}{r}
-3 \\
\hline
16 \\
-15 \\
\hline
15 \\
-15 \\
\hline
0
\end{array}
$$

c. $5\overline{)177.5}$ → 35.5

$$
\begin{array}{r}
-15 \\
\hline
27 \\
-25 \\
\hline
25 \\
-25 \\
\hline
0
\end{array}
$$

3. 8.43 ÷ 3

$3\overline{)8.^{2}43}$ → 2.81

84.3 ÷ 3

$3\overline{)8^{2}4.3}$ → 28.1

0.843 ÷ 3

$3\overline{)0.8^{2}43}$ → 0.281

4. a. $3\overline{)\$52.83}$ → $17.61

$$
\begin{array}{r}
-3 \\
\hline
22 \\
-21 \\
\hline
18 \\
-18 \\
\hline
03 \\
-\ 3 \\
\hline
0
\end{array}
$$

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b. $6\overline{)\$75.42}$ → $\$12.57$

-6
15
-12
34
-30
42
-42
0

c. $5\overline{)\$84.05}$ → $\$16.81$

-5
34
-30
40
-40
05
- 5
0

5. a. $4\overline{)356.4}$ → 89.1

89.1 pounds

b. $6\overline{)\$247.50}$ → $\$41.25$

6. a. $\$0.75 \times 9 = \$6.75$

$\$10.00 - \$6.75 = \$3.25$

b.
$\$3.50$
$\$4.25$
$\$2.75$
$\$2.75$
$\$1.80$
$+ \$1.35$
$\$16.40$

$\$20.00 - \$16.40 = \$3.60$

$5\overline{)\$16.40}$ → $\$3.28$

c. $2 \times 8 = 16$

$\$2.75 \times 16 = \$44.00$

Review

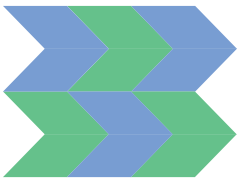
1. radius = 12 cm
diameter = 24 cm

$C = \pi d$
$C \approx 3.14 \times 24$ cm
$C \approx 75.36$ cm
circumference ≈ 75.36 cm

$A = \pi r^2$
$A \approx 3.14 \times (12 \text{ cm})^2$
$A \approx 3.14 \times (12 \text{ cm} \times 12 \text{ cm})$
$A \approx 3.14 \times 144 \text{ cm}^2$
$A \approx 452.16 \text{ cm}^2$
area ≈ 452.16 cm^2

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2. Answers will vary. An example tessellation is shown.



3. a. $6 \div \frac{3}{4} = 6 \times \frac{4}{3} = \frac{\overset{2}{\cancel{6}}}{1} \times \frac{4}{\underset{1}{\cancel{3}}} = 8$

b. $\frac{5}{6} \div \frac{2}{3} = \frac{5}{6} \times \frac{3}{2} = \frac{5}{\underset{2}{\cancel{6}}} \times \frac{\overset{1}{\cancel{3}}}{2} = \frac{5}{4} = 1\frac{1}{4}$

4. least to greatest: 32, 38, 45, 45, 54

32 + 38 + 45 + 45 + 54 = 214
There are 5 numbers.
214 ÷ 5 = 42.8
mean: 42.8

32, 38, (45), 45, 54
median: 45

32, 38, (45), (45), 54
mode: 45

(32), 38, 45, 45, (54)
54 - 32 = 22
range: 22

5. $\frac{2}{3} + \frac{1}{4} - \frac{5}{6}$
$= \frac{8}{12} + \frac{3}{12} - \frac{10}{12}$
$= \frac{11}{12} - \frac{10}{12}$
$= \frac{1}{12}$

DIVISION WITH TERMINATING AND REPEATING DECIMALS

Video Lesson

Top Problem

$4.\overline{4}$	0.125	0.090909...
R	T	R

Bottom Problem

$$
\begin{array}{r}
0.5454\ldots \\
11\overline{)6.0000} \\
-55 \\
\hline
50 \\
-44 \\
\hline
60 \\
-55 \\
\hline
50 \\
-44 \\
\hline
6
\end{array}
$$

$\frac{6}{11} = 0.\overline{54}$

Practice

1. a. T

b. R

c. R

d. R

e. T

f. T

g. R

h. R

2. a. $0.\overline{5}$

b. $0.\overline{36}$

c. $43.2\overline{4}$

d. $95.\overline{123}$

3. a.
$$
\begin{array}{r}
0.125 \\
8\overline{)1.000} \\
-\ 8 \\
\hline
20 \\
-16 \\
\hline
40 \\
-40 \\
\hline
0
\end{array}
$$

b.
$$
\begin{array}{r}
7.5 \\
2\overline{)15.0} \\
-14 \\
\hline
10 \\
-10 \\
\hline
0
\end{array}
$$

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4. a.
$$\begin{array}{r} 0.7272\ldots \\ 11\overline{)8.0000} \\ -77 \\ \hline 30 \\ -22 \\ \hline 80 \\ -77 \\ \hline 30 \\ -22 \\ \hline 8 \end{array} = 0.\overline{72}$$

b.
$$\begin{array}{r} 1.66\ldots \\ 3\overline{)5.00} \\ -3 \\ \hline 20 \\ -18 \\ \hline 20 \\ -18 \\ \hline 2 \end{array} = 1.\overline{6}$$

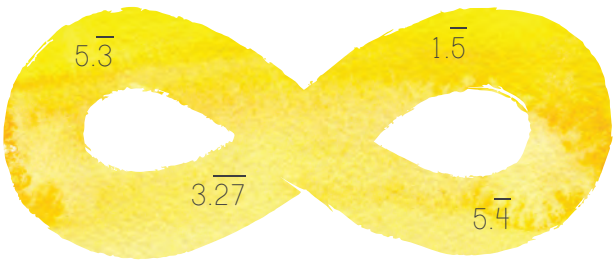
5. a.
$$\begin{array}{r} 0.4545\ldots \\ 11\overline{)5.0000} \\ -44 \\ \hline 60 \\ -55 \\ \hline 50 \\ -44 \\ \hline 60 \\ -55 \\ \hline 5 \end{array} = 0.\overline{45}$$

$5 \div 11 = 0.\overline{45}$

b.
$$\begin{array}{r} 0.14 \\ 50\overline{)7.00} \\ -50 \\ \hline 200 \\ -200 \\ \hline 0 \end{array}$$

$7 \div 50 = 0.14$

6.



a.
$$\begin{array}{r} 0.375 \\ 8\overline{)3.000} \\ -24 \\ \hline 60 \\ -56 \\ \hline 40 \\ -40 \\ \hline 0 \end{array}$$

$3 \div 8 = 0.375$

b.
$$\begin{array}{r} 5.33\ldots \\ 3\overline{)16.00} \\ -15 \\ \hline 10 \\ -9 \\ \hline 10 \\ -9 \\ \hline 1 \end{array} = 5.\overline{3}$$

$16 \div 3 = 5.\overline{3}$

c.
$$\begin{array}{r} 1.55\ldots \\ 9\overline{)14.00} \\ -9 \\ \hline 50 \\ -45 \\ \hline 50 \\ -45 \\ \hline 5 \end{array} = 1.\overline{5}$$

$14 \div 9 = 1.\overline{5}$

d.
$$\begin{array}{r} 1.75 \\ 4\overline{)7.00} \\ -4 \\ \hline 30 \\ -28 \\ \hline 20 \\ -20 \\ \hline 0 \end{array}$$

$7 \div 4 = 1.75$

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e.
$$\begin{array}{r} 3.2727\ldots = 3.\overline{27} \\ 11\overline{)36.0000} \\ -33 \\ \hline 30 \\ -22 \\ \hline 80 \\ -77 \\ \hline 30 \\ -22 \\ \hline 80 \\ -77 \\ \hline 3 \end{array}$$

$36 \div 11 = 3.\overline{27}$

f.
$$\begin{array}{r} 5.44\ldots = 5.\overline{4} \\ 9\overline{)49.00} \\ -45 \\ \hline 40 \\ -36 \\ \hline 40 \\ -36 \\ \hline 4 \end{array}$$

$49 \div 9 = 5.\overline{4}$

Review

1.
$$\begin{array}{r} 700.4 \\ 6\overline{)4,202.4} \\ -42 \\ \hline 00 \\ -0 \\ \hline 02 \\ -0 \\ \hline 24 \\ -24 \\ \hline 0 \end{array}$$

700.4 miles

2. a. $\frac{4}{3}$

b. $\frac{1}{7}$

c. $2\frac{8}{9} = \frac{26}{9}$

$\frac{9}{26}$

3. $C = \pi d$ or $C = 2(\text{pi})r$

$A = \pi r^2$

4. a. 5.6

round up

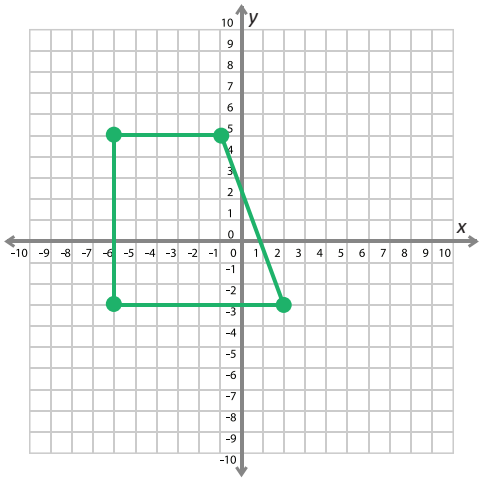
6

b. Half of 8 is 4. 5 is greater than 4.

$\frac{5}{8}$ is greater than $\frac{1}{2}$ $\longrightarrow$ round up

$9\frac{5}{8} \longrightarrow 10$

5.



4 sides

1 pair of parallel sides

2 right angles

trapezoid

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FINDING AVERAGES WITH REMAINDERS

Practice

1. a. 10 + 10 + 18 + 2 = 40
There are 4 numbers.
40 ÷ 4 = 10
mean: 10

b. 11 + 14 + 62 + 77 + 80 = 244
There are 5 numbers.

$$5\overline{)244.0} = 48.8$$

mean: 48.8

2. a. 0.4, 0.8, 1.5, 4.6, 8.8
median: 1.5

b. 45, 64, 68, 82
64 + 68 = 132
There are 2 numbers.

$$2\overline{)132} = 66$$

median: 66

3. a. 55, 62, 64, 64, 73, 74, 74
modes: 64 and 74

b. 87, 100, 110, 120, 120, 122
mode: 120

4. a. 8, 12, 21
21 - 8 = 13
range: 13

b. 25, 44, 68, 75, 93
93 - 25 = 68
range: 68

5. a. least to greatest: 9, 9, 12, 14

9 + 9 + 12 + 14 = 44
There are 4 numbers.
44 ÷ 4 = 11
mean: 11

9, 9, 12, 14
9 + 12 = 21
There are 2 numbers.
21 ÷ 2 = 10.5
median: 10.5

9, 9, 12, 14
mode: 9

9, 9, 12, 14
14 - 9 = 5
range: 5

b. least to greatest: 7, 12, 12, 15, 56, 87

7 + 12 + 12 + 15 + 56 + 87 = 189
There are 6 numbers.

$$6\overline{)189.0} = 31.5$$

mean: 31.5

7, 12, 12, 15, 56, 87
12 + 15 = 27
There are 2 numbers.

$$2\overline{)27.0} = 13.5$$

median: 13.5

7, 12, 12, 15, 56, 87
mode: 12

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7, 12, 12, 15, 56, 87
87 - 7 = 80
range: 80

6. a. least to greatest: 3.6, 7.2, 7.2

3.6 + 7.2 + 7.2 = 18
There are 3 numbers.
18 ÷ 3 = 6
mean: 6

3.6, 7.2, 7.2
median: 7.2

3.6, 7.2, 7.2
mode: 7.2

3.6, 7.2, 7.2
7.2 - 3.6 = 3.6
range: 3.6

b. least to greatest: 20.06, 23.02, 23.02, 31.9

20.06 + 23.02 + 23.02 + 31.9 = 98
There are 4 numbers.

$$4\overline{)98.20}\quad 24.5$$

mean: 24.5

20.06, 23.02, 23.02, 31.9
The two middle numbers are the same.
median: 23.02

20.06, 23.02, 23.02, 31.9
mode: 23.02

20.06, 23.02, 23.02, 31.9
31.9 - 20.06 = 11.84
range: 11.84

7. least to greatest: 80, 81.2, 82.3, 83.5, 85

80 + 81.2 + 82.3 + 83.5 + 85 = 412
There are 5 numbers.

$$5\overline{)412.0}\quad 82.4$$

mean: 82.4 °F

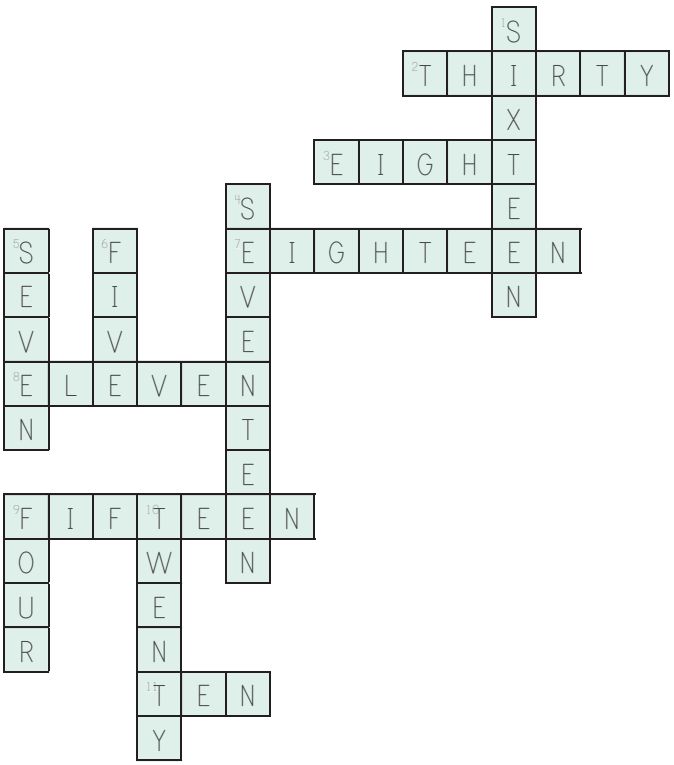
80, 81.2, 82.3, 83.5, 85
median: 82.3 °F

80, 81.2, 82.3, 83.5, 85
mode: no mode

80, 81.2, 82.3, 83.5, 85
85 - 80 = 5
range: 5 °F

Crossword Puzzle

Work for each problem is shown on the next page.



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Across

2. 25, 28, 30, 31, 48
median: 30

3. 4, 7, 8, 9, 10
median: 8

7. 10, 11, 18, 18, 18, 19, 19
mode: 18

8. 7, 9, 10, 11, 13, 20, 23
median: 11

9. 15, 15, 16, 17, 18
mode: 15

11. 9, 10, 10, 10, 11, 11, 12
mode: 10

Down

1. 12, 16, 16, 20, 22
mode: 16

4. 15, 16, 17, 18, 19
median: 17

5. 5, 5, 6, 6, 7, 7, 7, 8
mode: 7

6. 2, 4, 5, 17, 20
median: 5

9. 3, 3, 4, 7, 12
median: 4

10. 5, 18, 20, 20, 24, 31
mode: 20

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Review

1.

$$
\begin{array}{r}
1.8181\ldots = 1.\overline{81} \\
11\overline{)20.0000} \\
-11 \\
\hline
90 \\
-88 \\
\hline
20 \\
-11 \\
\hline
90 \\
-88 \\
\hline
20 \\
-11 \\
\hline
9
\end{array}
$$

2. radius = 46 cm
diameter = 92 cm

$C = \pi d$
$C \approx 3.14 \times 92$ cm
$C \approx 288.88$ cm
circumference ≈ 288.88 cm

3. a. 0.06 ⟶ 0.06 ⟶ 6%

b. 0.99 ⟶ 0.99 ⟶ 99%

c. 13% ⟶ 13% ⟶ 0.13

d. 200% ⟶ 200% ⟶ 2

4.

$$
\begin{array}{r}
{\scriptstyle 4\ 4} \\
7.05 \\
\times\ \ 9.4 \\
\hline
2820 \\
+63450 \\
\hline
66.270
\end{array}
$$

66.27

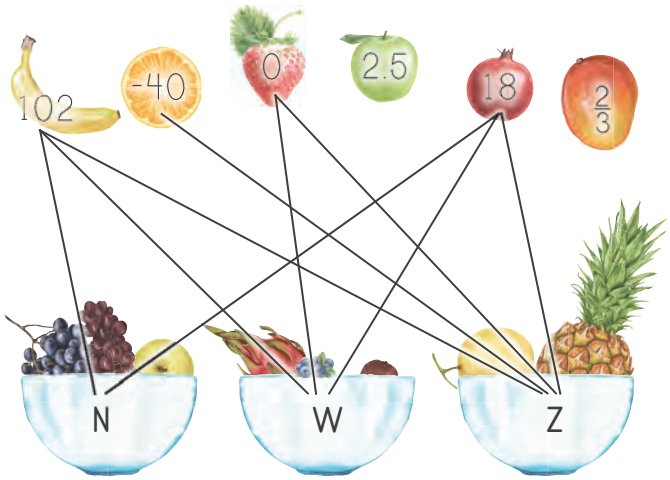
5. -7 + 4 = -3
-3 + 4 = 1
1 + 4 = 5
5 + 4 = 9
9 + 4 = 13
13 + 4 = 17

-7, -3, 1, 5, 9, 13, 17
rule: add 4

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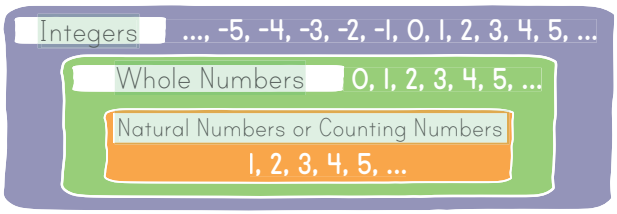
NUMBER CATEGORIES

Video Lesson



Practice

1.



2. Answers may vary.

a. any counting number greater than 5 (6, 7, 8, 9, etc.)

b. any counting number greater than 5 (6, 7, 8, 9, etc.)

c. any counting number greater than 5 or the opposite of those counting numbers (-9, -8, -7, -6, 6, 7, 8, 9, etc.)

3.

numbers that are greater than zero	positive numbers
numbers that are also called counting numbers	natural numbers
numbers that are less than zero	negative numbers
natural numbers and zero	whole numbers
natural numbers, the opposites of the natural numbers, and zero	integers
two numbers that are the same distance from zero but in opposite directions	opposite numbers

4. a. N, W, Z

b. N, W, Z

c. Z

d. W, Z

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5. a. -9

b. -15

c. 4

d. -73

e. 57

f. -102

g. 68

h. 212

6. a. 1, 3, 5, 7, 9

b. 6, 12, 18, 24

c. Answers will vary but may include 0 and negative numbers such as -1, -2, -3, -4.

7.

-11	~~7.2~~	24	0	~~$\frac{1}{2}$~~
32	-2	-84	~~0.9~~	-45
300	-50	~~7,803~~	-981	~~$6\frac{1}{3}$~~
88	-549	~~9.3~~	225	-794

Natural Numbers

24, 32, 300, 88, 225

Whole Numbers

24, 0, 32, 300, 88, 225

Integers

-11, 24, 0, 32, -2, -84, -45, 300, -50, -981, 88, -549, 225, -794

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Review

1. least to greatest: 14, 15, 18, 18, 20, 20

14 + 15 + 18 + 18 + 20 + 20 = 105
There are 6 numbers.

$$6\overline{)10^{4}5.^{3}0}\quad 17.5$$

mean: 17.5

14, 15, 18, 18, 20, 20
The two middle numbers are the same.
median: 18

14, 15, 18, 18, 20, 20
modes: 18 and 20

14, 15, 18, 18, 20, 20
20 - 14 = 6
range: 6

2. a. $3\overline{)95.^{2}1}$ 31.7

b. $11\overline{)0.044}$ 0.004

3. area of bottom rectangle: 6 m × 9 m = 54 m^2
area of back slanted rectangle: 5 m × 9 m = 45 m^2
area of front slanted rectangle: 5 m × 9 m = 45 m^2
area of front triangle: $\frac{6\text{ m} \times 4\text{ m}}{2} = \frac{24\text{ m}^2}{2} = 12\text{ m}^2$
area of back triangle: $\frac{6\text{ m} \times 4\text{ m}}{2} = \frac{24\text{ m}^2}{2} = 12\text{ m}^2$

surface area of the triangular prism: 54 m^2 + 45 m^2 + 45 m^2 + 12 m^2 + 12 m^2 = 168 m^2

4. a. $\frac{21}{50} \times \frac{2}{2} = \frac{42}{100} = 42\%$

b. $\frac{9}{10} \times \frac{10}{10} = \frac{90}{100} = 90\%$

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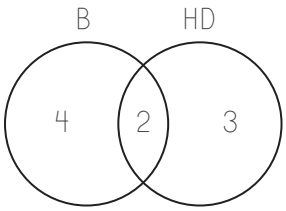
VENN DIAGRAMS WITH SETS

Video Lesson

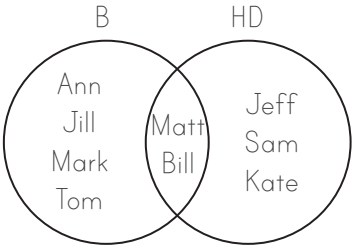
Top Box

{51, 53, 55, 57, 59}
{31, 28, 30}

Bottom Left Box



Bottom Right Box



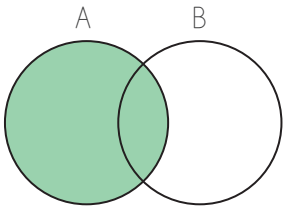
Practice

1. a. infinite
   b. finite
   c. empty
   d. finite

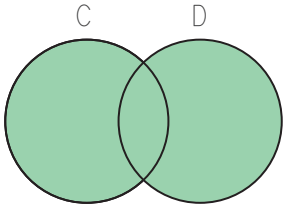
2. a. (given)
   b. B = {-6, -7, -8, -9, -10, ...}
   c. C = {13, 14}

3. a. A = {7, 14, 21, 28, 35, 42}
   b. yes
   c. no
   d. no
   e. yes

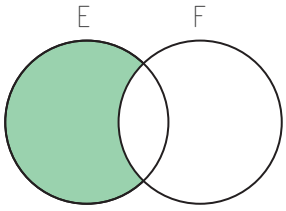
4. a.



b.

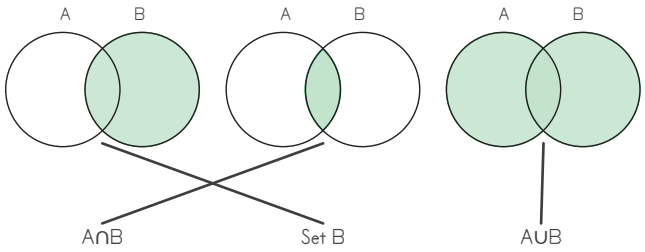


c.

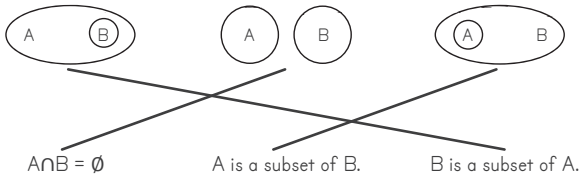


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5.



6.



7. a. 6 + 3 = 9

b. 3 + 8 = 11

c. 3

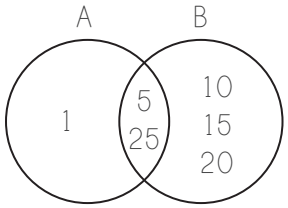
d. 6 + 3 + 8 = 17

8. a. 3 + 1 = 4

b. 1 + 2 = 3

c. 35

9.



A∪B = {1, 5, 10, 15, 20, 25}
A∩B = {5, 25}

Review

1. -5 41 ~~5/7~~ ~~-3.3~~ 0 122

Natural Numbers	Whole Numbers	Integers
41, 122	41, 0, 122	-5, 41, 0, 122

2. a.

```
   2.1875
16)35.0000
  -32
    30
   -16
    140
   -128
     120
    -112
      80
     -80
       0
```

b.

```
   1.875
8)15.000
  - 8
    70
   -64
     60
    -56
      40
     -40
       0
```

3. radius = 28.4 yd
diameter = 56.8 yd

$A = \pi r^2$
$A \approx 3.14 \times (28.4 \text{ yd})^2$
$A \approx 3.14 \times (28.4 \text{ yd} \times 28.4 \text{ yd})$
$A \approx 3.14 \times 806.56 \text{ yd}^2$
$A \approx 2{,}532.5984 \text{ yd}^2$
area ≈ 2,532.5984 yd²

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CONVERTING FRACTIONS TO DECIMALS AND PERCENTS

Video Lesson

$\frac{2}{7} \longrightarrow$

```
   0.285
7 ) 2.000
   -14
    60
   -56
     40
    -35
      5
```

$\frac{2}{7} \approx 0.29 \quad 0.29 \longrightarrow 0.29\%$

$\frac{2}{7} \approx 29\%$

Practice

1. a. $\frac{1}{4} = 0.25$

b. $\frac{9}{25} \longrightarrow$

```
   0.36
25 ) 9.00
   -75
    150
   -150
      0
```

$\frac{9}{25} = 0.36$

c. $\frac{8}{5} \longrightarrow$

```
   1.6
5 ) 8.0
   -5
    30
   -30
     0
```

$\frac{8}{5} = 1.6$

2. a. $0.25 \longrightarrow 0.25\%$
$0.25 = 25\%$

b. $0.36 \longrightarrow 0.36\%$
$0.36 = 36\%$

c. $1.6 \longrightarrow 1.60\%$
$1.6 = 160\%$

3.

Fraction	Decimal	Percent
$\frac{9}{10}$	0.9	0.90% 90%
$\frac{6}{5}$	1.2 5) 6.0 -5 10 -10 0	1.20% 120%
$\frac{5}{4}$	1.25 4) 5.00 -4 10 -8 20 -20 0	1.25% 125%

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4. a. $\frac{2}{9} \longrightarrow 9\overline{)2.00}$

-18

20

-18

2

$\frac{2}{9} \approx 0.2$ $\qquad 0.2 \longrightarrow 0.20\%$

$\frac{2}{9} \approx 20\%$

b. $\frac{7}{15} \longrightarrow 15\overline{)7.000}$

-60

100

-90

100

-90

10

$\frac{7}{15} \approx 0.47$ $\qquad 0.47 \longrightarrow 0.47\%$

$\frac{7}{15} \approx 47\%$

c. $\frac{9}{7} \longrightarrow 7\overline{)9.0}$

-7

20

-14

6

$\frac{9}{7} \approx 1$ $\qquad 1 \longrightarrow 1.00\%$

$\frac{9}{7} \approx 100\%$

5. a. hunting for food: $\frac{6}{7}$

NOT hunting for food: $1 - \frac{6}{7} = \frac{7}{7} - \frac{6}{7} = \frac{1}{7}$

$\frac{1}{7} \longrightarrow 7\overline{)1.000}$

-7

30

-28

20

-14

6

$\frac{1}{7} \approx 0.14$

$0.14 \longrightarrow 0.14\%$

14%

b. $\frac{1}{50} \longrightarrow 50\overline{)1.00}$

-100

0

$\frac{1}{50} = 0.02$

$0.02 \longrightarrow 0.02\%$

2%

6. a. fraction: $\frac{1}{3}$

decimal: 0.333

percent: 33.3%

b. fraction: $\frac{2}{5}$

decimal: $5\overline{)2.0}$ $\quad 0.4$

-20

0

percent: $0.40\% = 40\%$

c. fraction: $\frac{7}{8}$

decimal: $8\overline{)7.000}$ $\quad 0.875$

-64

60

-56

40

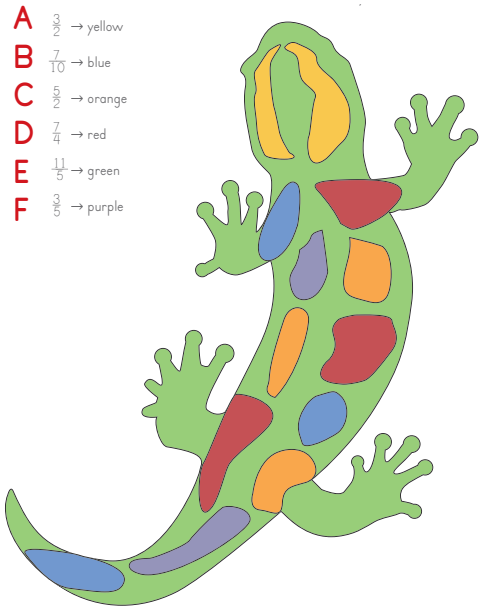
-40

0

percent: $0.875\% = 87.5\%$

7. Work for each problem is shown below.

A $\frac{3}{2}$ → yellow
B $\frac{7}{10}$ → blue
C $\frac{5}{2}$ → orange
D $\frac{7}{4}$ → red
E $\frac{11}{5}$ → green
F $\frac{3}{5}$ → purple



A $\frac{3}{2} \longrightarrow 2\overline{)3.0}$

$$\begin{array}{r} 1.5 \\ -2 \\ \hline 10 \\ -10 \\ \hline 0 \end{array}$$

$1.5 = 1.50\%$

$\frac{3}{2} = 1.5 = 150\%$

B $\frac{7}{10} = 0.7$

$0.7 \longrightarrow 0.70\%$

$\frac{7}{10} = 0.7 = 70\% = \frac{70}{100}$

C $\frac{5}{2} \longrightarrow 2\overline{)5.0}$

$$\begin{array}{r} 2.5 \\ -4 \\ \hline 10 \\ -10 \\ \hline 0 \end{array}$$

$2.5 \longrightarrow 2.50\%$

$\frac{5}{2} = 2\frac{1}{2} = 2.5 = 250\%$

D $\frac{7}{4} \longrightarrow 4\overline{)7.00}$

$$\begin{array}{r} 1.75 \\ -4 \\ \hline 30 \\ -28 \\ \hline 20 \\ -20 \\ \hline 0 \end{array}$$

$1.75 \longrightarrow 1.75\%$

$\frac{7}{4} = 1\frac{3}{4} = 1.75 = 175\%$

E $\frac{11}{5} \longrightarrow 5\overline{)11.0}$

$$\begin{array}{r} 2.2 \\ -10 \\ \hline 10 \\ -10 \\ \hline 0 \end{array}$$

$2.2 \longrightarrow 2.20\%$

$\frac{11}{5} = 2\frac{1}{5} = 2\frac{2}{10} = 2.2 = 220\%$

$\frac{44}{20} = \frac{22}{10} = \frac{11}{5}$

F $\frac{3}{5} \longrightarrow 5\overline{)3.0}$

$$\begin{array}{r} 0.6 \\ -30 \\ \hline 0 \end{array}$$

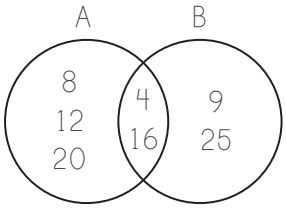
$0.6 \longrightarrow 0.60\%$

$\frac{3}{5} = 0.6 = 60\%$

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Review

1.



A∪B = {4, 8, 9, 12, 16, 20, 25}
A∩B = {4, 16}

2. least to greatest: 35, 35, 55, 61, 92

35 + 35 + 55 + 61 + 92 = 278
There are 5 numbers.

```
   55.6
5)278.0
 -25
  28
 -25
  30
 -30
   0
```

mean: 55.6

35, 35, 55, 61, 92
median: 55

35, 35, 55, 61, 92
mode: 35

35, 35, 55, 61, 92
92 - 35 = 57
range: 57

3. 3 × 37 =

3(30 + 7)
= (3 × 30) + (3 × 7)
= 90 + 21
= 111

4. $\frac{5}{6}$: Half of 6 is 3. 5 is greater than 3, so $\frac{5}{6}$ is greater than $\frac{1}{2}$.

$\frac{7}{20}$: Half of 20 is 10. 7 is less than 10, so $\frac{7}{20}$ is less than $\frac{1}{2}$.

$\frac{5}{6} > \frac{7}{20}$

5.

```
  7 9 9 10
  8.Ø Ø Ø 0
- 3.6 1 5
  4.3 8 5
```

VOLUME OF RECTANGULAR PRISMS AND CYLINDERS

Video Lesson

$V = \pi r^2 h$
$V \approx 3.14 \times (8 \text{ ft})^2 \times 50 \text{ ft}$
$V \approx 3.14 \times 64 \text{ ft}^2 \times 50 \text{ ft}$
$V \approx 3.14 \times 3{,}200 \text{ ft}^3$
$V \approx 10{,}048 \text{ ft}^3$

Practice

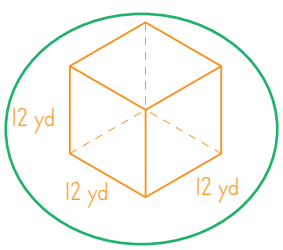
1. a. $V = \ell wh$
$V = 11 \text{ cm} \times 7 \text{ cm} \times 4 \text{ cm}$
$V = 11 \text{ cm} \times 28 \text{ cm}^2$
$V = 308 \text{ cm}^3$

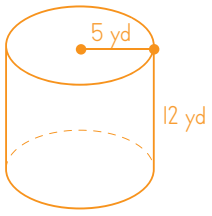
b. $V = \ell wh$
$V = 14 \text{ ft} \times 6 \text{ ft} \times 6 \text{ ft}$
$V = 14 \text{ ft} \times 36 \text{ ft}^2$
$V = 504 \text{ ft}^3$

2. a. $V = \pi r^2 h$
$V \approx 3.14 \times (9 \text{ mm})^2 \times 15 \text{ mm}$
$V \approx 3.14 \times 81 \text{ mm}^2 \times 15 \text{ mm}$
$V \approx 3.14 \times 1{,}215 \text{ mm}^3$
$V \approx 3{,}815.1 \text{ mm}^3$

b. $V = \pi r^2 h$
$V \approx 3.14 \times (3 \text{ cm})^2 \times 24 \text{ cm}$
$V \approx 3.14 \times 9 \text{ cm}^2 \times 24 \text{ cm}$
$V \approx 3.14 \times 216 \text{ cm}^3$
$V \approx 678.24 \text{ cm}^3$

3. Work for each solid is shown at the right.





Cube:
$V = \ell wh$
$V = 12 \text{ yd} \times 12 \text{ yd} \times 12 \text{ yd}$
$V = 144 \text{ yd}^2 \times 12 \text{ yd}$
$V = 1{,}728 \text{ yd}^3$

Cylinder:
$V = \pi r^2 h$
$V \approx 3.14 \times (5 \text{ yd})^2 \times 12 \text{ yd}$
$V \approx 3.14 \times 25 \text{ yd}^2 \times 12 \text{ yd}$
$V \approx 3.14 \times 300 \text{ yd}^3$
$V \approx 942 \text{ yd}^3$

4. a. $V = \ell wh$
$V = 1.2 \text{ cm} \times 1.2 \text{ cm} \times 1.2 \text{ cm}$
$V = 1.44 \text{ cm}^2 \times 1.2 \text{ cm}$
$V = 1.728 \text{ cm}^3$

b. $V = \pi r^2 h$
$V \approx 3.14 \times (1.6 \text{ in})^2 \times 4.5 \text{ in}$
$V \approx 3.14 \times 2.56 \text{ in}^2 \times 4.5 \text{ in}$
$V \approx 3.14 \times 11.52 \text{ in}^3$
$V \approx 36.1728 \text{ in}^3$

5. **Solid I:**
$V = \ell wh$
$V = 4.5 \text{ units} \times 4.5 \text{ units} \times 11 \text{ units}$
$V = 20.25 \text{ units}^2 \times 11 \text{ units}$
$V = 222.75 \text{ units}^3$

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Solid 2:

$V = \pi r^2 h$
$V \approx 3.14 \times (5 \text{ units})^2 \times 10 \text{ units}$
$V \approx 3.14 \times 25 \text{ units}^2 \times 10 \text{ units}$
$V \approx 3.14 \times 250 \text{ units}^3$
$V \approx 785 \text{ units}^3$

Solid 3:

$V = \ell wh$
$V = 7 \text{ units} \times 7 \text{ units} \times 7 \text{ units}$
$V = 49 \text{ units}^2 \times 7 \text{ units}$
$V = 343 \text{ units}^3$

Solid 4:

$V = \pi r^2 h$
$V \approx 3.14 \times (2 \text{ units})^2 \times 13 \text{ units}$
$V \approx 3.14 \times 4 \text{ units}^2 \times 13 \text{ units}$
$V \approx 3.14 \times 52 \text{ units}^3$
$V \approx 163.28 \text{ units}^3$

Solid 5:

$V = \ell wh$
$V = 6 \text{ units} \times 4.9 \text{ units} \times 2 \text{ units}$
$V = 12 \text{ units}^2 \times 4.9 \text{ units}$
$V = 58.8 \text{ units}^3$

Solid 6:

$V = \ell wh$
$V = 7 \text{ units} \times 2.5 \text{ units} \times 9 \text{ units}$
$V = 63 \text{ units}^2 \times 2.5 \text{ units}$
$V = 157.5 \text{ units}^3$

a. **I have a height greater than 6 units.** This could be solids 1, 2, 3, 4, or 6.
I have six faces. This could be solids 1, 3, or 6.
My volume is greater than 60 cubic units. This could be solids 1, 3, or 6.
The measure of my length does not equal my width. This is solid 6.
My number is 6.

b. **I am not a cube.** This could be solids 1, 2, 4, 5, or 6.
I have two circular faces. This could be solids 2 and 4.
My diameter has the same measure as my height. This is solid 2.
My number is 2.

Review

1. a. $\frac{2}{5} \longrightarrow 5\overline{)2.0}$

$$\begin{array}{r} 0.4 \\ 5\overline{)2.0} \\ -20 \\ \hline 0 \end{array}$$

$0.4 \longrightarrow 0.40\%$
$\frac{2}{5} = 0.4 = 40\%$

b. $\frac{17}{5} \longrightarrow 5\overline{)17.0}$

$$\begin{array}{r} 3.4 \\ 5\overline{)17.0} \\ -15 \\ \hline 20 \\ -20 \\ \hline 0 \end{array}$$

$3.4 \longrightarrow 3.40\%$
$\frac{17}{5} = 3.4 = 340\%$

2. $80 + 94 + 96 + 100 + 112 = 482$
There are 5 numbers.

$$\begin{array}{r} 96.4 \\ 5\overline{)482.0} \\ -45 \\ \hline 32 \\ -30 \\ \hline 20 \\ -20 \\ \hline 0 \end{array}$$

mean: 96.4

80, 94, 96, 100, 112
median: 96

80, 94, 96, 100, 112
mode: no mode

80, 94, 96, 100, 112

112 - 80 = 32

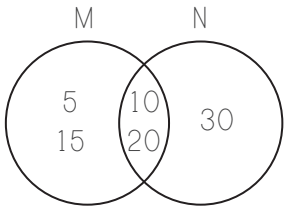
range: 32

3. a.

$$\begin{array}{r} 3.561 \\ 8\overline{)28.488} \\ -24 \\ \hline 44 \\ -40 \\ \hline 48 \\ -48 \\ \hline 08 \\ -8 \\ \hline 0 \end{array}$$

b. $\frac{5}{6} \div \frac{1}{12} = \frac{5}{6} \times \frac{12}{1} = \frac{5}{\cancel{6}_{1}} \times \frac{\cancel{12}^{2}}{1} = 10$

4.



M∩N = {10, 20}

M∪N = {5, 10, 15, 20, 30}

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DIVIDING BY DECIMALS

Video Lesson

Left Box

$54 \div 0.15 \longrightarrow 54 \div 0.15 \longrightarrow 5400 \div 15$

$$15\overline{)5400} = 360$$

Right Box

$18.22 \div 0.4 \longrightarrow 18.22 \div 0.4 \longrightarrow 182.2 \div 4$

$$4\overline{)182.20} = 45.55$$

Practice

1. a. (given)

b. $0.5\overline{)6.5} \longrightarrow 5\overline{)65} = 13$

c. $1.1\overline{)5.61} \longrightarrow 11\overline{)561} = 5.1$

d. $0.008\overline{)0.664} \longrightarrow 8\overline{)664} = 83$

2. a. $2.2\overline{)5.06} \longrightarrow 22\overline{)50.6} = 2.3$

$$\begin{array}{r} -44 \\ \hline 66 \\ -66 \\ \hline 0 \end{array}$$

b. $0.7\overline{)19.95} \longrightarrow 7\overline{)199.5} = 28.5$

$$\begin{array}{r} -14 \\ \hline 59 \\ -56 \\ \hline 35 \\ -35 \\ \hline 0 \end{array}$$

3. a. $0.09\overline{)1.38} \longrightarrow 9\overline{)138.00} = 15.33\ldots = 15.\overline{3}$

$$\begin{array}{r} -9 \\ \hline 48 \\ -45 \\ \hline 30 \\ -27 \\ \hline 30 \\ -27 \\ \hline 3 \end{array}$$

b. $0.12\overline{)0.5} \longrightarrow 12\overline{)50.000} = 4.166\ldots = 4.1\overline{6}$

$$\begin{array}{r} -48 \\ \hline 20 \\ -12 \\ \hline 80 \\ -72 \\ \hline 80 \\ -72 \\ \hline 8 \end{array}$$

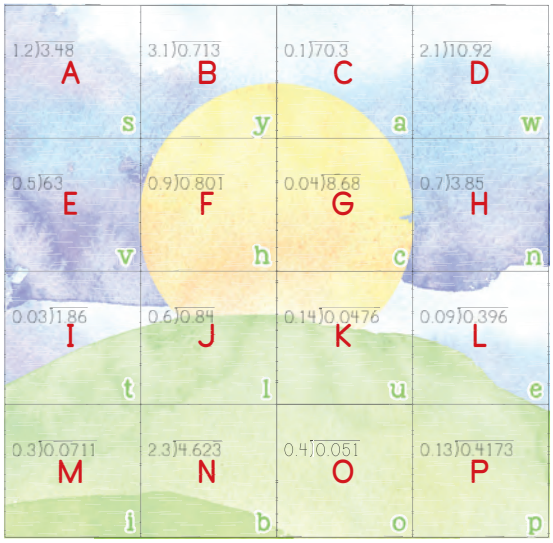
4. $2.8\overline{)8.96} \longrightarrow 28\overline{)89.6} = 3.2$

$$\begin{array}{r} -84 \\ \hline 56 \\ -56 \\ \hline 0 \end{array}$$

$3.20

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5. Work for each problem is shown below.



A $1.2\overline{)3.48} \longrightarrow 12\overline{)34.^{10}8}$ $\quad 2.9$

B $3.1\overline{)0.713} \longrightarrow 31\overline{)7.1^{9}3}$ $\quad 0.23$

C $0.1\overline{)70.3} \longrightarrow 1\overline{)703}$ $\quad 703$

D $2.1\overline{)10.92} \longrightarrow 21\overline{)109.^{4}2}$ $\quad 5.2$

E $0.5\overline{)63} \longrightarrow 5\overline{)6^{1}3^{3}0}$ $\quad 126$

F $0.9\overline{)0.801} \longrightarrow 9\overline{)8.0^{8}1}$ $\quad 0.89$

G $0.04\overline{)8.68} \longrightarrow 4\overline{)86^{2}8}$ $\quad 217$

H $0.7\overline{)3.85} \longrightarrow 7\overline{)38.^{3}5}$ $\quad 5.5$

I $0.03\overline{)1.86} \longrightarrow 3\overline{)186}$ $\quad 62$

J $0.6\overline{)0.84} \longrightarrow 6\overline{)8.^{2}4}$ $\quad 1.4$

K $0.14\overline{)0.0476} \longrightarrow 14\overline{)4.7^{5}6}$ $\quad 0.34$

L $0.09\overline{)0.396} \longrightarrow 9\overline{)39.^{3}6}$ $\quad 4.4$

M $0.3\overline{)0.0711} \longrightarrow 3\overline{)0.7^{1}1^{2}1}$ $\quad 0.237$

N $2.3\overline{)4.623} \longrightarrow 23\overline{)46.23}$ $\quad 2.01$

O $0.4\overline{)0.051} \longrightarrow 4\overline{)0.5^{1}1^{3}0^{2}0}$ $\quad 0.1275$

P $0.13\overline{)0.4173} \longrightarrow 13\overline{)41.^{2}7^{1}3}$ $\quad 3.21$

Why should you never argue with decimal numbers?

...	b	e	c	a	u	s	e		t	h	e	y	a	l	w	a	y	s		h	a	v	e	a	p	o	i	n	t	!
	2.01	4.4	217	703	0.34	2.9	4.4		62	0.89	4.4	0.23	703	1.4	5.2	703	0.23	2.9		0.89	703	126	4.4	703	3.21	0.1275	0.237	5.5	62	

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Review

1. surface area = 9 cm × 9 cm × 6 = 486 cm^2

2. radius = 14 ft
   diameter = 28 ft

   $C = \pi d$
   $C \approx 3.14 \times 28$ ft
   $C \approx 87.92$ ft
   circumference ≈ 87.92 ft

3. a. $4{,}301 \div 10^2 = 4{,}301 \div 10^2 = 43.01$

   b. $0.3207 \times 10^4 = 0.3207 \times 10^4 = 3{,}207$

4. a. N, W, Z

   b. W, Z

   c. Z

5. $\frac{\cancel{5}^{1}}{\cancel{9}_{1}} \times \frac{\cancel{5}^{1}}{\cancel{7}_{1}} \times \frac{\cancel{9}^{1}}{\cancel{25}_{\cancel{5}_{1}}} \times \frac{1}{\cancel{7}_{9}} = \frac{1}{9}$

TIME ZONES

Video Lesson

2:00 PM

Practice

1. 24
2. 1 hour
3. 5:30 PM
4. 6:25 AM on Friday
5. 11:03 AM
6. 4:47 PM
7. 3
8. Monday
9. 6
10. Oklahoma City, OK 4:38 PM
    Denver, CO 3:38 PM
    Boston, MA 5:38 PM
11. Honolulu, HI 7:45 AM
    Albany, NY 12:45 PM
    Austin, TX 11:45 AM
12. Nashville, TN 7:24 AM
    Juneau, AK 4:24 AM
    Sacramento, CA 5:24 AM
13. Frankfort, KY 2:55 PM
    Salem, OR 11:55 AM
    Little Rock, AR 1:55 PM

Review

1. a. $2.3\overline{)4.83} \rightarrow 23\overline{)48.3}$

$$\begin{array}{r} 2.1 \\ -46 \\ \hline 23 \\ -23 \\ \hline 0 \end{array}$$

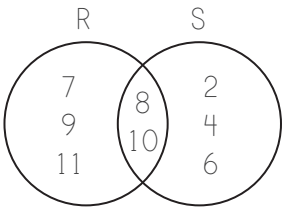
b. $0.6\overline{)7.7} \rightarrow 6\overline{)77.00}$ $= 12.8\overline{3}$

$$\begin{array}{r} 12.83\ldots \\ -6 \\ \hline 17 \\ -12 \\ \hline 50 \\ -48 \\ \hline 20 \\ -18 \\ \hline 2 \end{array}$$

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2. $\frac{23}{30} \div \frac{4}{5} = \frac{23}{\cancel{30}_{6}} \times \frac{\cancel{5}^{1}}{4} = \frac{23}{24}$

3.



$R \cap S = \{8, 10\}$

$R \cup S = \{2, 4, 6, 7, 8, 9, 10, 11\}$

4. $4\frac{5}{6} - 1\frac{4}{5}$

$= 4\frac{25}{30} - 1\frac{24}{30}$

$= 3\frac{1}{30}$

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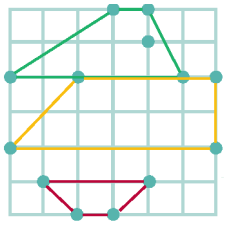
PLANETARY PUZZLES

Practice

1. All numbers are perfect squares except for 10.



2. Answers may vary. An example is given below.

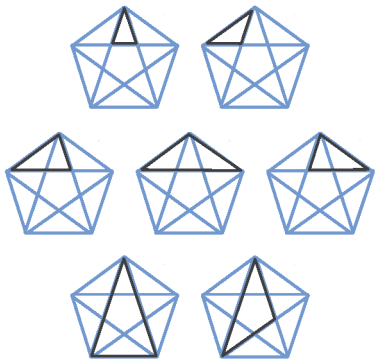


3. Answers may vary, but every path (vertically, horizontally, and diagonally) should add to 15. An example is given below.

4	3	8
9	5	1
2	7	6

4. 35

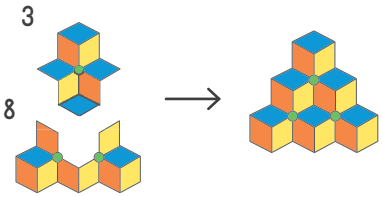
Each triangle shown below is rotated about the figure five times.



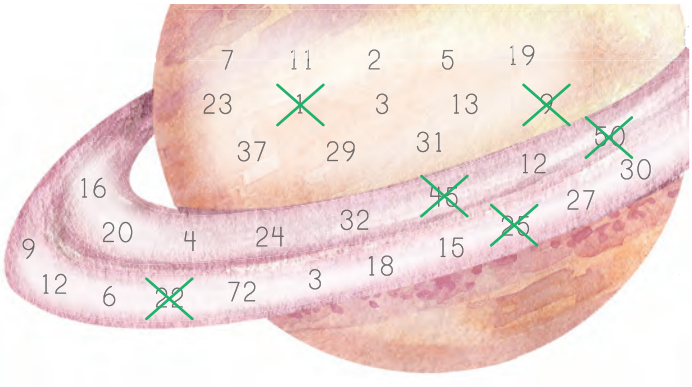
5. 1

$1 \times 1 = 1$ $\quad 1 + 1 = 2$ $\quad 2 > 1$

6. 3 and 8



7. On Saturn: All numbers are prime except 1 and 9.
On the inner ring: All numbers are multiples of 4 except 45 and 50.
On the outer ring: All numbers are multiples of 3 except 22 and 25.



8. $62 \div 2 = 31$
$2^5 = 32$
$\sqrt{225} = 15$

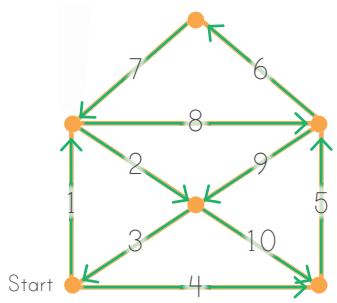


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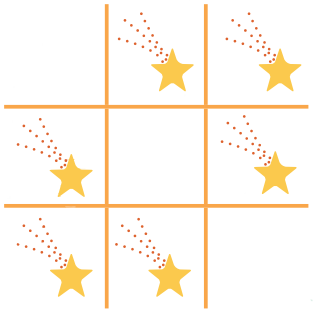
9. $(12 \times 11) \div 2 + 13 = 79$

10. $(12 \times 8) \div 3 + 8^2 - \sqrt{144} =$
$96 \div 3 + 8^2 - \sqrt{144} =$
$96 \div 3 + 64 - 12 =$
$32 + 64 - 12 =$
$96 - 12 =$
84

11. Answers may vary. An example path is shown below.



12. Answers may vary. An example answer is shown below.



13. 9 circles
The outside of each ring forms a new circle.

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PROPORTIONS

Video Lesson

Top Box

$\frac{4}{12} \overset{\div 2}{=} \frac{2}{6}$ or $\frac{4}{12} \overset{\div 4}{=} \frac{1}{3}$

Bottom Box

$\frac{2}{3} \overset{\times 12}{=} \frac{x}{36}$

$2 \times 12 = x$

$x = 24$

$\frac{2}{y} \overset{\div 9}{=} \frac{18}{45}$

$45 \div 9 = y$

$y = 5$

Practice

1. a. (given)

b. Five is to eight as ten is to sixteen.

c. One hundred is to ninety as ten is to nine.

2. Answers may vary. An example is given for each problem.

a. $\frac{10}{12} \overset{\div 2}{=} \frac{5}{6}$

b. $\frac{8}{56} \overset{\div 8}{=} \frac{1}{7}$

c. $\frac{45}{63} \overset{\div 9}{=} \frac{5}{7}$

3. Answers may vary. An example is given for each problem.

a. $\frac{6}{11} \overset{\times 3}{=} \frac{18}{33}$

b. $\frac{12}{5} \overset{\times 10}{=} \frac{120}{50}$

c. $\frac{10}{21} \overset{\times 2}{=} \frac{20}{42}$

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4. a. $\frac{42}{60} = \frac{21}{30}$ (÷ 2 above, ÷ 2 below)

b. $\frac{7}{8} = \frac{28}{32}$ (× 4 above, × 4 below)

c. $\frac{8}{81} \neq \frac{1}{11}$ (÷ 8 above)

11 is not a factor of 81.

d. $\frac{15}{45} \neq \frac{1}{5}$ (÷ 15 above, ÷ 9 below)

5. a. $\frac{4}{9} = \frac{a}{36}$ (× 4 above, × 4 below)

$4 \times 4 = a$

$a = 16$

b. $\frac{32}{20} = \frac{8}{b}$ (÷ 4 above, ÷ 4 below)

$20 \div 4 = b$

$b = 5$

c. $\frac{c}{18} = \frac{5}{6}$ (× 3 above, × 3 below)

$5 \times 3 = c$

$c = 15$

d. $\frac{6}{d} = \frac{30}{55}$ (÷ 5 above, ÷ 5 below)

$55 \div 5 = d$

$d = 11$

6. Answers may vary. An example is given for each problem.

a. (given)

b. $\frac{3}{4} = \frac{15}{20}$

c. $\frac{10}{1} = \frac{30}{3}$

d. $\frac{6}{12} = \frac{10}{20}$

e. $\frac{1}{10} = \frac{5}{50}$

f. $\frac{1}{6} = \frac{7}{42}$

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Review

1. a. 24

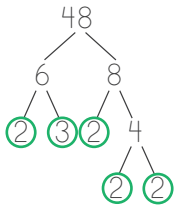
b. 1 hour

c. international date line

2. $4.2\overline{)5.46} \longrightarrow 42\overline{)54.6}$

$$\begin{array}{r} 1.3 \\ 42\overline{)54.6} \\ -42 \\ \hline 126 \\ -126 \\ \hline 0 \end{array}$$

3. Work may vary.



$2 \times 2 \times 2 \times 2 \times 3$

4.

Time	Interval	
9:24 AM	end time	
9:24 PM	12 hr	] 15 hr
6:24 PM	3 hr	
6:00 PM	24 min	] 44 min
5:40 PM	20 min	

start time: 5:40 PM

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SCALE DRAWINGS

Video Lesson

$$\frac{1 \text{ in}}{15 \text{ ft}} \overset{\times 5}{=} \frac{5 \text{ in}}{m \text{ ft}}$$

m = 75 ft

$A = \ell w$
$A = 90 \text{ ft} \times 75 \text{ ft}$
$A = 6{,}750 \text{ ft}^2$

Practice

1. a. measured distance: 2 cm

actual distance: $\frac{1 \text{ cm}}{500 \text{ m}} \overset{\times 2}{=} \frac{2 \text{ cm}}{x}$

x = 1,000 m

b. measured distance: 2 cm + 1 cm = 3 cm

actual distance: $\frac{1 \text{ cm}}{500 \text{ m}} \overset{\times 3}{=} \frac{3 \text{ cm}}{y}$

y = 1,500 m

c. measured distance: 3 cm + 2 cm = 5 cm

actual distance: $\frac{1 \text{ cm}}{500 \text{ m}} \overset{\times 5}{=} \frac{5 \text{ cm}}{z}$

z = 2,500 m

2. a. actual length of the family room:

$$\frac{1 \text{ cm}}{3 \text{ ft}} \overset{\times 6}{=} \frac{6 \text{ cm}}{\ell}$$

ℓ = 18 ft

actual width of the family room:

$$\frac{1 \text{ cm}}{3 \text{ ft}} \overset{\times 5}{=} \frac{5 \text{ cm}}{w}$$

w = 15 ft

actual area of the family room:
$A = \ell w$
$A = 18 \text{ ft} \times 15 \text{ ft}$
$A = 270 \text{ ft}^2$

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b. actual length of the kitchen:

$$\frac{1\text{ cm}}{3\text{ ft}} \overset{\times 4}{=} \frac{4\text{ cm}}{\ell}$$

ℓ = 12 ft

actual width of the kitchen:

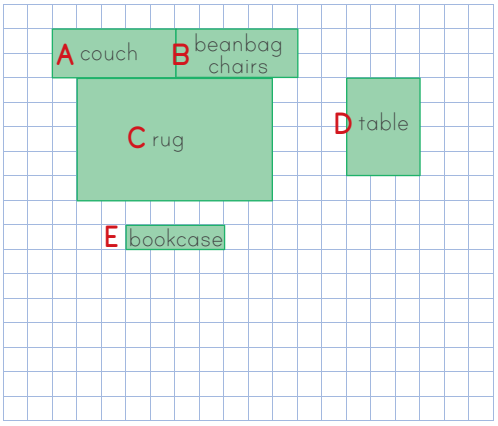
$$\frac{1\text{ cm}}{3\text{ ft}} \overset{\times 3}{=} \frac{3\text{ cm}}{w}$$

w = 9 ft

actual perimeter of the kitchen:
$P = 2\ell + 2w$
$P = 2(12\text{ ft}) + 2(9\text{ ft})$
$P = 24\text{ ft} + 18\text{ ft} = 42\text{ ft}$

3. Positions and orientations of objects will vary, but dimensions should match those on the sample answer below. Students should have drawn two additional objects using the scale 1 unit : 2 ft.

Work for finding the drawing dimensions of each object is shown below.



A couch dimension 1: $\frac{1\text{ unit}}{c} \overset{\div 2}{=} \frac{2\text{ ft}}{10\text{ ft}}$

c = 5 units

couch dimension 2: $\frac{1\text{ unit}}{2\text{ ft}} \overset{\times 2}{=} \frac{c}{4\text{ ft}}$

c = 2 units

couch drawing dimensions: 5 units × 2 units

B The actual dimensions for the beanbag chairs are the same as the actual dimensions for the couch, so the drawing dimensions are also the same.

beanbag chairs drawing dimensions:
5 units × 2 units

C rug dimension 1: $\frac{1\text{ unit}}{2\text{ ft}} \overset{\times 8}{=} \frac{r}{16\text{ ft}}$

r = 8 units

rug dimension 2: $\frac{1\text{ unit}}{2\text{ ft}} \overset{\times 5}{=} \frac{r}{10\text{ ft}}$

r = 5 units

rug drawing dimensions: 8 units × 5 units

D table dimension 1: $\frac{1\text{ unit}}{2\text{ ft}} \overset{\times 4}{=} \frac{t}{8\text{ ft}}$

t = 4 units

table dimension 2: $\frac{1\text{ unit}}{2\text{ ft}} \overset{\times 3}{=} \frac{t}{6\text{ ft}}$

t = 3 units

table drawing dimensions: 4 units × 3 units

E bookcase dimension 1: $\frac{1\text{ unit}}{2\text{ ft}} \overset{\times 4}{=} \frac{b}{8\text{ ft}}$

b = 4 units

bookcase dimension 2: $\frac{1\text{ unit}}{2\text{ ft}} \overset{\times 1}{=} \frac{b}{2\text{ ft}}$

b = 1 unit

bookcase drawing dimensions: 4 units × 1 unit

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Review

1. a. $\frac{2}{9} = \frac{a}{27}$ (× 3 above, × 3 below)

$a = 6$

b. $\frac{b}{49} = \frac{3}{7}$ (× 7 above, × 7 below)

$b = 21$

2. least to greatest: 1.2, 1.3, 1.4

1.4 + 1.2 + 1.3 = 3.9
There are 3 numbers.
mean: 3.9 ÷ 3 = 1.3

1.2, 1.3, 1.4
median: 1.3

1.2, 1.3, 1.4
mode: no mode

1.2, 1.3, 1.4
1.4 − 1.2 = 0.2
range: 0.2

3. a. 0.76 ⟶ 0.76% ⟶ 76%
0.76 = 76%

9 ⟶ 9.00% ⟶ 900%
9 = 900%

b. 4.8% ⟶ 04.8% ⟶ 0.048
4.8% = 0.048

702% ⟶ 702% ⟶ 7.02
702% = 7.02

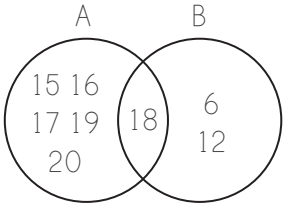
4. 0.7)5.06 ⟶ 7)50.600

```
   7.228
7)50.600
 -49
   16
  -14
   20
  -14
   60
  -56
    4
```

7.228
round up
7.23

5. Set A = {15, 16, 17, 18, 19, 20}

Set B = {6, 12, 18}



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BUILD A HOUSE: DAY 1

1. The student should have created a floor plan that includes the required rooms using the scale 1 unit : 3 feet. Rooms should be rectangular.

2. a. Answers will vary based on the student's drawing. An example calculation for a kitchen that is 4 units × 5 units on the drawing is shown below.

Room	Length on Drawing (in units)	Width on Drawing (in units)	Actual Length (in feet)	Actual Width (in feet)
kitchen	4 units	5 units	12 ft	15 ft

length of kitchen:

$$\frac{1 \text{ unit}}{3 \text{ ft}} \overset{\times 4}{=} \frac{4 \text{ units}}{\ell}$$

ℓ = 12 ft

actual length: 12 ft

width of kitchen:

$$\frac{1 \text{ unit}}{3 \text{ ft}} \overset{\times 5}{=} \frac{5 \text{ units}}{w}$$

w = 15 ft

actual width: 15 ft

b.

Object	Diameter on Drawing (in units)	Actual Diameter (in feet)
pond	2 units	6 ft

$$\frac{1 \text{ unit}}{3 \text{ ft}} \overset{\times 2}{=} \frac{2 \text{ units}}{d}$$

d = 6 ft

actual diameter: 6 ft

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c.

Object	Height on Drawing (in units)	Base on Drawing (in units)	Actual Height (in feet)	Actual Base (in feet)
garden	3 units	4 units	9 ft	12 ft

$$\frac{1 \text{ unit}}{3 \text{ ft}} \overset{\times 3}{=} \frac{3 \text{ units}}{h}$$

$h = 9$ ft

actual height: 9 ft

$$\frac{1 \text{ unit}}{3 \text{ ft}} \overset{\times 4}{=} \frac{4 \text{ units}}{b}$$

$b = 12$ ft

actual base: 12 ft

BUILD A HOUSE: DAY 2

1. a. Answers will vary.

b. Answers will vary.

c. Answers will vary based on the student's house size. An example calculation for a house that is 30 units long is shown below.

$$\frac{1 \text{ unit}}{3 \text{ ft}} \overset{\times 30}{=} \frac{30 \text{ units}}{\ell}$$

ℓ = 90 ft
Actual length of house: 90 ft

d. Answers will vary based on the student's house size. An example calculation for a house that is 20 units wide is shown below.

$$\frac{1 \text{ unit}}{3 \text{ ft}} \overset{\times 20}{=} \frac{20 \text{ units}}{w}$$

w = 60 ft
Actual width of house: 60 ft

e. Answers will vary based on the student's house size, but the student should have multiplied the length by the width to find the area (in ft^2).

2. a. area

Answers will vary based on the student's living room size. An example calculation for a living room that is 10 ft × 15 ft is shown below.

$A = \ell w$
A = 10 ft × 15 ft
A = 150 ft^2
Amount of carpet: 150 ft^2

150 ft^2 × \$2.04/ft^2 = \$306.00
Cost: \$306.00

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b. perimeter

Answers will vary based on the student's three bedroom sizes. An example calculation for three 10 ft × 10 ft bedrooms is shown below.

$P = 2\ell + 2w$
$P = 2(10 \text{ ft}) + 2(10 \text{ ft})$
$P = 20 \text{ ft} + 20 \text{ ft}$
$P = 40 \text{ ft}$ (one bedroom)
$40 \text{ ft} \times 3 = 120 \text{ ft}$
Length of baseboard: 120 ft

c. area

$A = \frac{bh}{2}$

$A = \frac{12 \text{ ft} \times 9 \text{ ft}}{2}$

$A = 54 \text{ ft}^2$
Amount of landscape fabric: 54 ft^2

d. perimeter

Answers will vary based on the student's house size. An example calculation of an 80 ft × 20 ft house is shown below.

$P = 2\ell + 2w$
$P = 2(80 \text{ ft}) + 2(20 \text{ ft})$
$P = 160 \text{ ft} + 40 \text{ ft}$
$P = 200 \text{ ft}$
Feet of flowers: 200 ft

e. circumference

$C = \pi d$
$C \approx 3.14 \times 6 \text{ ft}$
$C \approx 18.84 \text{ ft}$
Feet of stones: 18.84 ft

3. Answers will vary based on the student's drawing. Calculations based on a 50 ft × 20 ft house with a 10 ft × 10 ft bedroom are shown below.

House:
$A = \ell w$
$A = 50 \text{ ft} \times 20 \text{ ft}$
$A = 1{,}000 \text{ ft}^2$
The area of the whole house is $1{,}000 \text{ ft}^2$.

bedroom:
$A = \ell w$
$A = 10 \text{ ft} \times 10 \text{ ft}$
$A = 100 \text{ ft}^2$
area of room: 100 ft^2

$\frac{100}{1000} = \frac{1}{10}$
fraction of house: $\frac{1}{10}$

$\frac{1}{10} = 0.1$
$0.1 \rightarrow 0.10\% \rightarrow 10\%$
percent of house: 10%

Room	Area of Room (in sq ft)	Fraction of House (in simplest form)	Percent of House
bedroom	100 sq ft	$\frac{1}{10}$	10%

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PERCENT OF A NUMBER

Video Lesson

20% of 365
0.2 × 365

$$\begin{array}{r} {\scriptstyle 1\ 1} \\ 365 \\ \times\ \ 0.2 \\ \hline 73.0 \end{array}$$

0.2 × 365 = 73
73 days

Practice

1. a. 4 ÷ 1 = 4

b. 940 ÷ 1 = 940

2. a. 10 ÷ 2 = 5

b. 62 ÷ 2 = 31

3. a. 32 ÷ 4 = 8

b. 200 ÷ 4 = 50

4. a. 50 ÷ 10 = 5

b. 325 ÷ 10 = 325 ÷ 10 = 32.5

5. a. 300 ÷ 100 = 3

b. 505 ÷ 100 = 505 ÷ 100 = 5.05

6. a. 36 ÷ 2 = 18

b. 54 ÷ 10 = 54 ÷ 10 = 5.4

c. 85 ÷ 1 = 85

d. 650 ÷ 100 = 650 ÷ 100 = 6.5

e. 804 ÷ 4 = 201

f. 145 ÷ 10 = 145 ÷ 10 = 14.5

7. a. (given)

b. 0.22 × 40

$$\begin{array}{r} 0.22 \\ \times\ 40 \\ \hline 8.80 \end{array}$$

22% of 40 = 8.8

c. 0.6 × 100 = 60
60% of 100 = 60

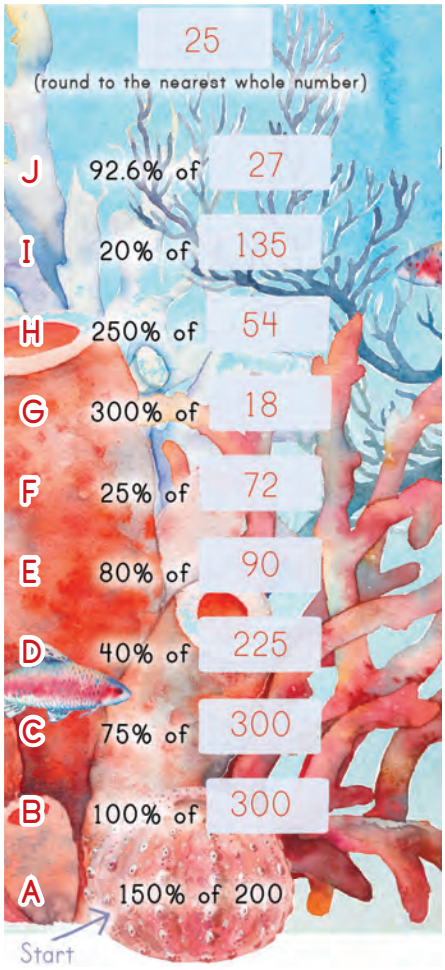
d. 0.35 × 15

$$\begin{array}{r} {\scriptstyle 1\ 2} \\ 0.35 \\ \times\ \ 15 \\ \hline 175 \\ +350 \\ \hline 5.25 \end{array}$$

35% of 15 = 5.25

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8. Work for each problem is shown below.



A 1.5 × 200

$$\begin{array}{r} 200 \\ \times\ 1.5 \\ \hline 1000 \\ +2000 \\ \hline 300.0 \end{array}$$

150% of 200 = 300

B 300 ÷ 1 = 300
100% of 300 = 300

C 0.75 × 300

$$\begin{array}{r} 300 \\ \times\ 0.75 \\ \hline 1500 \\ +21000 \\ \hline 225.00 \end{array}$$

75% of 300 = 225

D 0.4 × 225

$$\begin{array}{r} {\scriptstyle 1\ 2} \\ 225 \\ \times\ 0.4 \\ \hline 90.0 \end{array}$$

40% of 225 = 90

E 0.8 × 90

$$\begin{array}{r} 90 \\ \times\ 0.8 \\ \hline 72.0 \end{array}$$

80% of 90 = 72

F 0.25 × 72

$$\begin{array}{r} {\scriptstyle 3} \\ \not{7} \\ 0.25 \\ \times\ 72 \\ \hline 50 \\ +1750 \\ \hline 18.00 \end{array}$$

25% of 72 = 18

G 3 × 18 = 54
300% of 18 = 54

H 2.5 × 54

$$\begin{array}{r} {\scriptstyle 2} \\ 54 \\ \times\ 2.5 \\ \hline 270 \\ +1080 \\ \hline 135.0 \end{array}$$

250% of 54 = 135

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I 0.2×135

$$\begin{array}{r} {\scriptstyle 1} \\ 135 \\ \times\ 0.2 \\ \hline 27.0 \end{array}$$

20% of 135 = 27

J 0.926×27

$$\begin{array}{r} {\scriptstyle 1\ 1}\not{} \\ 0.926 \\ \times\ \ 27 \\ \hline 6482 \\ +18520 \\ \hline 25.002 \end{array}$$

92.6% of 27 = 25.002

25.002
round down
25

Review

1. rectangle drawing dimensions:

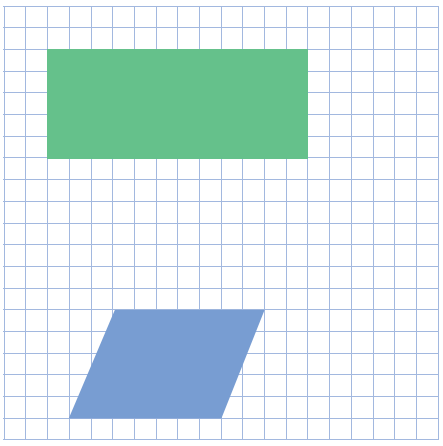
$$\frac{1 \text{ unit}}{12 \text{ ft}} \overset{\times 12}{=} \frac{x}{144 \text{ ft}}$$

$x = 12$ units

$$\frac{1 \text{ unit}}{12 \text{ ft}} \overset{\times 5}{=} \frac{y}{60 \text{ ft}}$$

$y = 5$ units

A 12 unit by 5 unit rectangle should be drawn somewhere on the grid. An example is shown below.



actual length of parallelogram's base:
length on drawing: 7 units

$$\frac{1 \text{ unit}}{12 \text{ ft}} \overset{\times 7}{=} \frac{7 \text{ units}}{z}$$

$z = 84$ ft

2. a. $\frac{132}{121} \overset{\div 11}{=} \frac{c}{11}$

$c = 12$

b. $\frac{63}{49} \overset{\div 7}{=} \frac{9}{d}$

$d = 7$

3. ratio of yellow squares to green squares in one row: $\frac{2}{1}$

ratio of total yellow squares to total green squares: $\frac{8}{4}$

$\frac{2}{1} = \frac{8}{4}$

4. 802,110

The number is divisible by 2 because it is even.

8 + 2 + 1 + 1 = 12. 12 is divisible by 3, so 802,110 is divisible by 3.

The number formed by the last 2 digits (10) is not divisible by 4, so 802,110 is not divisible by 4.

The number is divisible by 5 because it ends in a 0.

The number is divisible by 6 because it is divisible by both 2 and 3.

The sum of the digits (12) is not divisible by 9, so 802,110 is not divisible by 9.

The number is divisible by 10 because it ends in a 0.

(2) (3) 4 (5) (6) 9 (10)

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MULTIPLYING MIXED NUMBERS

Video Lesson

Top Left Box

$1\frac{1}{2} \times 2\frac{1}{2} = \frac{3}{2} \times \frac{5}{2} = \frac{15}{4} = 3\frac{3}{4}$

$3\frac{3}{4}$ c sugar

Top Right Box

$\frac{1}{2} \times 2\frac{1}{2} = \frac{1}{2} \times \frac{5}{2} = \frac{5}{4} = 1\frac{1}{4}$

$1\frac{1}{4}$ Tbsp vanilla

Bottom Left Box

$2 \times 2\frac{1}{2} = \frac{2}{1} \times \frac{5}{2} = \frac{\cancel{2}^{1}}{1} \times \frac{5}{\cancel{2}_{1}} = \frac{5}{1} = 5$

5 eggs

Bottom Right Box

$1\frac{5}{8} \times 2\frac{1}{2} = \frac{13}{8} \times \frac{5}{2} = \frac{65}{16} = 4\frac{1}{16}$

$4\frac{1}{16}$ c chocolate chips

Practice

1. a. $1\frac{1}{2} \times 6 = \frac{3}{2} \times \frac{6}{1} = \frac{3}{\cancel{2}_{1}} \times \frac{\cancel{6}^{3}}{1} = \frac{9}{1} = 9$

b. $2 \times 3\frac{1}{6} = \frac{2}{1} \times \frac{19}{6} = \frac{\cancel{2}^{1}}{1} \times \frac{19}{\cancel{6}_{3}} = \frac{19}{3} = 6\frac{1}{3}$

c. $7\frac{3}{5} \times 10 = \frac{38}{5} \times \frac{10}{1} = \frac{38}{\cancel{5}_{1}} \times \frac{\cancel{10}^{2}}{1} = \frac{76}{1} = 76$

2. a. $1\frac{2}{5} \times 3\frac{4}{7} = \frac{7}{5} \times \frac{25}{7} = \frac{\cancel{7}^{1}}{\cancel{5}_{1}} \times \frac{\cancel{25}^{5}}{\cancel{7}_{1}} = \frac{5}{1} = 5$

b. $3\frac{2}{3} \times 1\frac{1}{2} = \frac{11}{3} \times \frac{3}{2} = \frac{11}{\cancel{3}_{1}} \times \frac{\cancel{3}^{1}}{2} = \frac{11}{2} = 5\frac{1}{2}$

c. $4\frac{2}{7} \times 5\frac{3}{5} = \frac{30}{7} \times \frac{28}{5} = \frac{\cancel{30}^{6}}{\cancel{7}_{1}} \times \frac{\cancel{28}^{4}}{\cancel{5}_{1}} = \frac{24}{1} = 24$

3. a. $1\frac{1}{7} \times 4\frac{2}{3} \times 1\frac{1}{8} =$

$\frac{8}{7} \times \frac{14}{3} \times \frac{9}{8} =$

$\frac{\cancel{8}^{1}}{\cancel{7}_{1}} \times \frac{\cancel{14}^{2}}{\cancel{3}_{1}} \times \frac{\cancel{9}^{3}}{\cancel{8}_{1}} = \frac{6}{1}$

$\frac{6}{1} = 6$

b. $2\frac{4}{5} \times 1\frac{1}{3} \times 2\frac{1}{2} =$

$\frac{14}{5} \times \frac{4}{3} \times \frac{5}{2} =$

$\frac{\cancel{14}^{7}}{\cancel{5}_{1}} \times \frac{4}{3} \times \frac{\cancel{5}^{1}}{\cancel{2}_{1}} = \frac{28}{3}$

$\frac{28}{3} = 9\frac{1}{3}$

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4. a. $A = \ell w$

$A = 5\frac{1}{2}\text{ in} \times 5\frac{1}{2}\text{ in}$

$A = \frac{11}{2}\text{ in} \times \frac{11}{2}\text{ in}$

$A = \frac{121}{4}\text{ in}^2$

$A = 30\frac{1}{4}\text{ in}^2$

b. $A = b \times h \times \frac{1}{2}$

$A = 2\frac{1}{3}\text{ ft} \times 3\frac{1}{9}\text{ ft} \times \frac{1}{2}$

$A = \frac{7}{3}\text{ ft} \times \frac{28}{9}\text{ ft} \times \frac{1}{2}$

$A = \frac{7}{3}\text{ ft} \times \frac{\overset{14}{\cancel{28}}}{9}\text{ ft} \times \frac{1}{\cancel{2}_{1}}$

$A = \frac{98}{27}\text{ ft}^2$

$A = 3\frac{17}{27}\text{ ft}^2$

c. $V = \ell wh$

$V = 3\frac{1}{2}\text{ yd} \times 3\frac{1}{2}\text{ yd} \times 3\frac{1}{2}\text{ yd}$

$V = \frac{7}{2}\text{ yd} \times \frac{7}{2}\text{ yd} \times \frac{7}{2}\text{ yd}$

$V = \frac{343}{8}\text{ yd}^3$

$V = 42\frac{7}{8}\text{ yd}^3$

d. $V = \ell wh$

$V = 2\frac{1}{4}\text{ mm} \times 6\frac{2}{3}\text{ mm} \times 4\frac{1}{5}\text{ mm}$

$V = \frac{9}{4}\text{ mm} \times \frac{20}{3}\text{ mm} \times \frac{21}{5}\text{ mm}$

$V = \frac{\overset{3}{\cancel{9}}}{\underset{1}{\cancel{4}}}\text{ mm} \times \frac{\overset{1}{\cancel{5}}\cancel{20}}{\underset{1}{\cancel{3}}}\text{ mm} \times \frac{21}{\underset{1}{\cancel{5}}}\text{ mm}$

$V = \frac{63}{1}\text{ mm}^3$

$V = 63\text{ mm}^3$

5. a. $2\frac{1}{4} \times 2\frac{1}{3} = \frac{9}{4} \times \frac{7}{3} = \frac{\overset{3}{\cancel{9}}}{4} \times \frac{7}{\underset{1}{\cancel{3}}} = \frac{21}{4} = 5\frac{1}{4}$

$5\frac{1}{4}$ cups

b. $1\frac{3}{4} \times 3\frac{1}{2} = \frac{7}{4} \times \frac{7}{2} = \frac{49}{8} = 6\frac{1}{8}$

$6\frac{1}{8}$ cups

c. $1\frac{1}{4} \times 1\frac{1}{2} = \frac{5}{4} \times \frac{3}{2} = \frac{15}{8} = 1\frac{7}{8}$

$1\frac{7}{8}$ cups

d. $1\frac{1}{3} \times 2\frac{1}{2} = \frac{4}{3} \times \frac{5}{2} = \frac{\overset{2}{\cancel{4}}}{3} \times \frac{5}{\underset{1}{\cancel{2}}} = \frac{10}{3} = 3\frac{1}{3}$

$3\frac{1}{3}$ cups

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Review

1. a. $408 \div 2 = 204$
50% of $408 = 204$

b. 0.55×310

$$\begin{array}{r} 310 \\ \times\ 0.55 \\ \hline 1550 \\ +15500 \\ \hline 170.50 \end{array}$$

55% of $310 = 170.5$

c. $7{,}700 \div 100 = 77$
1% of $7{,}700 = 77$

2. $4 + 6^2 \div 9 - 3 =$
$4 + 36 \div 9 - 3 =$
$4 + 4 - 3 =$
$8 - 3 =$
5

3.

$$\begin{array}{r} {\scriptstyle 1} \\ 24.5 \\ \times\ 11.2 \\ \hline 490 \\ 2450 \\ +24500 \\ \hline 274.40 \end{array}$$

274.4

4. $\frac{1}{3} = \frac{4}{12}$
$\frac{5}{12} = \frac{5}{12}$
$\frac{3}{4} = \frac{9}{12}$

$\frac{4}{12} < \frac{5}{12} < \frac{9}{12}$

$\frac{1}{3}, \frac{5}{12}, \frac{3}{4}$

5. a. $\frac{22}{9} = 2\frac{4}{9}$

Half of 9 is 4.5. 4 is less than 4.5.

$\frac{4}{9}$ is less than $\frac{1}{2} \rightarrow$ round down

$2\frac{4}{9} \rightarrow 2$

b. 0.502
round up
1

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PROBLEM SOLVING

Video Lesson

18 : 54 or $\frac{18}{54}$

$\frac{18}{54} = \frac{1}{3}$ (÷ 18 above and below)

1 : 3 or $\frac{1}{3}$

Practice

1.

twice as many	multiplication (×)
difference	subtraction (−)
of	multiplication (×)
altogether	addition (+)
remaining	subtraction (−)
half	division (÷)
fewer	subtraction (−)
sum	addition (+)
share equally	division (÷)

2. Students should have checked off the box for each instruction as they completed it.

a. **Problem A.** Jon makes cards for people in his neighborhood. ~~Each card costs $0.45 to make.~~ If Jon delivers 8 cards each week, how many cards does he deliver in 12 weeks?

operation(s) needed: multiplication

8 cards per week × 12 weeks = 96 cards

answer: 96 cards

b. **Problem B.** ~~Makenna and Blake made cookies.~~ Makenna made 24 cookies, and Blake made twice as many as Makenna. How many cookies did they make altogether?

operation(s) needed: multiplication, addition

number of cookies made by Blake: 24 × 2 = 48

cookies made altogether:
24 cookies + 48 cookies = 72 cookies

answer: 72 cookies

c. **Problem C.** Marni practiced the cello for 20 minutes on 5 different days last week. ~~She had a recital coming up~~, so she practiced 35 minutes on a sixth day. ~~Her neighborhood recital lasted $1\frac{1}{2}$ hours.~~ For how many minutes altogether did Marni practice the cello last week?

operation(s) needed: multiplication, addition

minutes practiced the first 5 days:
20 minutes × 5 = 100 minutes

total minutes practiced:
100 minutes + 35 minutes = 135 minutes

answer: 135 minutes

d. **Problem D.** ~~Jace loves to play soccer 3 days each week.~~ His team ordered 16 pizzas after a game, and $\frac{1}{4}$ of the pizzas had pepperoni. Of the remaining pizzas, $\frac{1}{2}$ were cheese. How many fewer pepperoni pizzas than cheese pizzas did the team order?

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operation(s) needed: multiplication, subtraction

number of pepperoni pizzas: $\frac{1}{4} \times 16$ pizzas = 4 pizzas

number of remaining pizzas: 16 − 4 = 12 pizzas

number of cheese pizzas: $\frac{1}{2} \times 12$ pizzas = 6 pizzas

how many fewer pepperoni than cheese pizzas: 6 − 4 = 2

answer: 2 pizzas

e. **Problem E.** Talia had 72 marbles. She decided to give away half of them. ~~She also gave away half of her stickers.~~ The marbles she gave away were shared equally by 4 friends. How many marbles did each friend receive?

operation(s) needed: multiplication, division

number of marbles given away:

$\frac{1}{2} \times 72$ marbles = 36 marbles

number of marbles each friend received:
36 marbles ÷ 4 = 9 marbles

answer: 9 marbles

f. **Problem F.** ~~Cole sold 150 paintings last year.~~ He sells the small paintings for $5.25 and large paintings for $12.50. If Cole sold 6 small and 4 large paintings this week, how much did he make this week?

operation(s) needed: multiplication, addition

amount made from small paintings:

$$\begin{array}{r} {\scriptstyle 1\ 3} \\ \$5.25 \\ \times \quad 6 \\ \hline \$31.50 \end{array}$$

amount made from large paintings:

$$\begin{array}{r} {\scriptstyle 1\ 2} \\ \$12.50 \\ \times \quad 4 \\ \hline \$50.00 \end{array}$$

amount made this week:
$31.50 + $50.00 = $81.50

answer: $81.50

3. a. $8\overline{)9^{1}65}$ R5 → 120 R5

Drop the remainder.
120 packages

b. total number of passengers: 42 + 15 = 57

$12\overline{)57}$ → 4 R9, −48, 9

Round up to the next whole.
5 vans

c. total miles: 15 + 42 = 57

$6\overline{)57.0}$ → 9.5, −54, 30, −30, 0

9.5 miles

d. children playing volleyball: 112 − 27 = 85

$14\overline{)85}$ → 6 R1, −84, 1

All teams have 6 players, and there is one child left over. One team has 7 players.

6 children on 13 teams, 7 children on 1 team

Review

1. $3\frac{3}{8} \times 1\frac{5}{9} = \frac{27}{8} \times \frac{14}{9} = \frac{\overset{3}{\cancel{27}}}{\underset{4}{\cancel{8}}} \times \frac{\overset{7}{\cancel{14}}}{\underset{1}{\cancel{9}}} = \frac{21}{4} = 5\frac{1}{4}$

2. a. 489.12 ÷ 10 = 489.12 ÷ 10 = 48.912
10% of 489.12 = 48.912

b. 0.65 × 900

$$\begin{array}{r} 900 \\ \times\ 0.65 \\ \hline 4500 \\ +54000 \\ \hline 585.00 \end{array}$$

65% of 900 = 585

3. $7\frac{1}{2} - 4\frac{1}{3}$
$= 7\frac{3}{6} - 4\frac{2}{6}$
$= 3\frac{1}{6}$

4. millions place: 9,745,686,039.2563
round up
9,746,000,000

billions place: 9,745,686,039.2563
round up
10,000,000,000

5. a. $6.5 \times 10^3 = 6.500 \times 10^3 = 6{,}500$
6.5 L = 6,500 mL

b. 1 gal = 4 qt
3.1 × 4 = 12.4
3.1 gallons = 12.4 qt

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CAMPGROUND PROBLEM SOLVING

Practice

1. a. 6 people × 5 s'mores per person = 30 s'mores

1 bag of marshmallows makes 40 s'mores. 40 is greater than 30.
marshmallows: 1 package

$\frac{1}{3}$ bar of chocolate per s'more × 30 s'mores = 10 bars of chocolate needed
1 package of chocolate bars contains 8 bars, so 2 packages are needed.
chocolate bars: 2 packages

1 graham cracker per s'more × 30 s'mores = 30 graham crackers needed
3 packages per box × 9 graham crackers per package = 27 graham crackers per box
1 box of graham crackers contains 27 crackers, so 2 boxes are needed.
graham crackers: 2 packages

b. 40 s'mores per bag of marshmallows × 2 bags = 80 s'mores

8 bars of chocolate per package × 3 s'mores per bar of chocolate = 24 s'mores per package
24 s'mores per package × 2 packages = 48 s'mores

3 packages per box × 9 graham crackers per package = 27 graham crackers per box
27 s'mores per box × 2 boxes = 54 s'mores

Chocolate bars have the fewest servings per package, and two packages make 48 s'mores, so with two packages of ingredients, 48 s'mores can be made.

2. Carlos: 5^3 ants = 5 × 5 × 5 ants = 125 ants
Matias: $3^4 + 2^5$ ants = 3 × 3 × 3 × 3 + 2 × 2 × 2 × 2 × 2 ants = 81 ants + 32 ants = 113 ants
125 > 113
125 − 113 = 12
Carlos, 12 ants

3. 6 foil packet dinners × 0.75 potatoes per packet

$$\begin{array}{r} {\scriptstyle 4\ \ 3} \\ 0.75 \\ \times\ \ 6 \\ \hline 4.50 \end{array}$$

4.5 or $4\frac{1}{2}$ potatoes

6 foil packet dinners × 1.75 carrots per packet

$$\begin{array}{r} {\scriptstyle 4\ \ 3} \\ 1.75 \\ \times\ \ 6 \\ \hline 10.50 \end{array}$$

10.5 or $10\frac{1}{2}$ carrots

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4. mixing time: $\frac{2}{3} \times 15$ minutes $= \frac{2}{3} \times \frac{15}{1}$ minutes $= \frac{2}{\cancel{3}_{1}} \times \frac{\cancel{15}^{5}}{1}$ minutes $= \frac{10}{1}$ minutes $= 10$ minutes

total time: mixing time + cooking time + cooling time
10 minutes + 50 minutes + 15 minutes = 75 minutes or 1 hour 15 minutes
1 hour 15 minutes before 6:00 PM is 4:45 PM
4:45 PM

5. 1.5 hours × 60 minutes per hour = 90 minutes
If the family sang songs for 40% of the time, then Dad told stories for 60% (100% − 40%) of the time.
60% of 90 minutes
= 0.6 × 90
= 54 minutes

6. $\frac{1}{4} \times 3$ miles $= \frac{1}{4} \times \frac{3}{1}$ miles $= \frac{3}{4}$ miles
$\frac{3}{4}$ miles to the waterfall + $\frac{3}{4}$ miles back = $1\frac{1}{2}$ or 1.5 miles

7. $\frac{2 \text{ birds}}{3 \text{ hikers}} = \frac{b}{15 \text{ hikers}}$ (× 5 above, × 5 below)

b = 10 birds

8. purple flowers: $\frac{1}{3} \times 42$ flowers $= \frac{1}{3} \times \frac{42}{1}$ flowers $= \frac{1}{\cancel{3}_{1}} \times \frac{\cancel{42}^{14}}{1}$ flowers $= \frac{14}{1}$ flowers $= 14$ flowers

red flowers: $\frac{1}{6} \times 42$ flowers $= \frac{1}{6} \times \frac{42}{1}$ flowers $= \frac{1}{\cancel{6}_{1}} \times \frac{\cancel{42}^{7}}{1}$ flowers $= \frac{7}{1}$ flowers $= 7$ flowers

purple or red flowers: 14 flowers + 7 flowers = 21 flowers
not purple or red flowers: 42 flowers − 21 flowers = 21 flowers

9. % of people: 100% − 45% − 15% − 20% = 20%
% of pictures that are of living things: 45% + 20% = 65%
65% of 40 pictures
= 0.65 × 40 pictures

$$\begin{array}{r} {\scriptstyle 2\ \ 2} \\ 0.65 \\ \times\ \ 40 \\ \hline 26.00 \end{array}$$

living things: 26 pictures
40 pictures − 26 pictures = 14 pictures
nonliving things: 14 pictures

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10. 30 minutes before 7:28 PM is 6:58 PM
total time: 3 hours + 50 minutes = 3 hours 50 minutes
3 hours before 6:58 PM is 3:58 PM
50 minutes before 3:58 PM is 3:08 PM
3:08 PM

Review

1. $3\frac{1}{3} \times 1\frac{1}{2} = \frac{10}{3} \times \frac{3}{2} = \frac{\cancel{10}^{5}}{\cancel{3}_{1}} \times \frac{\cancel{3}^{1}}{\cancel{2}_{1}} = \frac{5}{1} = 5$

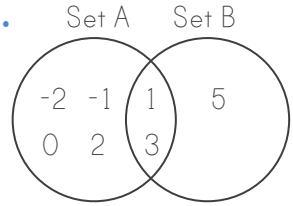
2. $\frac{4}{5} \div \frac{3}{4} = \frac{4}{5} \times \frac{4}{3} = \frac{16}{15} = 1\frac{1}{15}$

3. a. $5{,}690 \div 1 = 5{,}690$

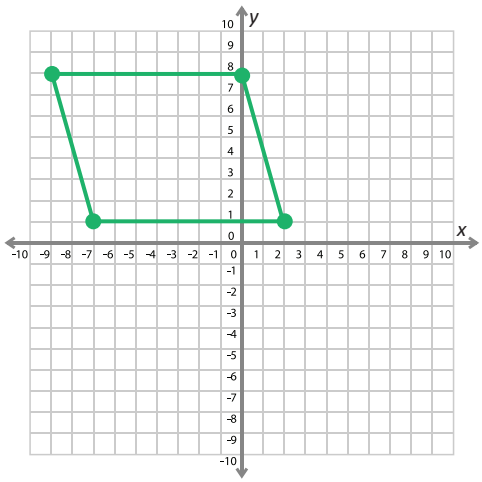
b. $0.2 \times 70 = 14$

4. $\frac{9}{28} \times \frac{14}{27} = \frac{\cancel{9}^{1}}{\cancel{28}_{2}} \times \frac{\cancel{14}^{1}}{\cancel{27}_{3}} = \frac{1}{6}$

5.



6. a.



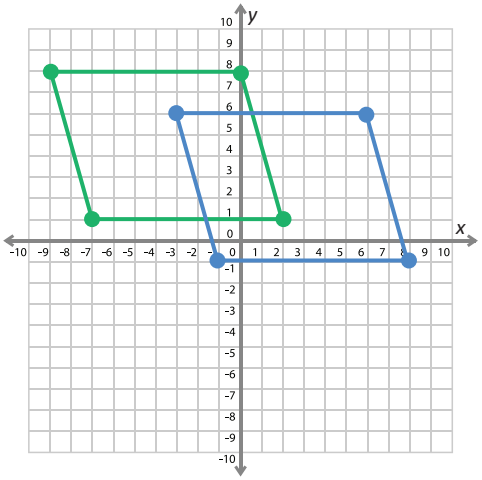
b. 2

c. 0

d. 2

e. parallelogram

f.



(−3, 6), (6, 6), (8, −1), (−1, −1)

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ADVANCED NUMBER PATTERNS

Practice

1. a. -12, -6, 0, 6, 12, 18
(+6 +6 +6 +6 +6)

A rule: +6

b. 625, 125, 25, 5, 1, $\frac{1}{5}$
(÷5 ÷5 ÷5 ÷5 ÷5)

G rule: ÷5

c. 56.8, 53.7, 50.6, 47.5, 44.4
(−3.1 −3.1 −3.1 −3.1)

A rule: −3.1

d. $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$, 1, $1\frac{1}{4}$, $1\frac{1}{2}$
($+\frac{1}{4}$ $+\frac{1}{4}$ $+\frac{1}{4}$ $+\frac{1}{4}$ $+\frac{1}{4}$)

A rule: $+\frac{1}{4}$

2. a. 3.1, 3.8, 4.5, 5.2
(+0.7 +0.7 +0.7)

rule: +0.7

5.2 + 0.7 = 5.9
5.9 + 0.7 = 6.6
6.6 + 0.7 = 7.3

5.9, 6.6, 7.3

b. $\frac{1}{8}$, $\frac{1}{4}$, $\frac{1}{2}$, 1
(×2 ×2 ×2)

rule: ×2

1 × 2 = 2
2 × 2 = 4
4 × 2 = 8

2, 4, 8

c. 160, 80, 40, 20
(÷2 ÷2 ÷2)

rule: ÷2

20 ÷ 2 = 10
10 ÷ 2 = 5
5 ÷ 2 = 2.5 or $2\frac{1}{2}$

10, 5, 2.5 or $2\frac{1}{2}$

3. a. 5 × 3 = 15
15 × 3 = 45
45 × 3 = 135
135 × 3 = 405

5, 15, 45, 135, 405

b. 9 ÷ 3 = 3
3 ÷ 3 = 1
1 ÷ 3 = $\frac{1}{3}$
$\frac{1}{3}$ ÷ 3 = $\frac{1}{9}$

9, 3, 1, $\frac{1}{3}$, $\frac{1}{9}$

c. 22 − 10 = 12
12 − 10 = 2
2 − 10 = −8
−8 − 10 = −18

22, 12, 2, −8, −18

4. a. (given)

b. 45, 33, 99, 87, 261, 249
(−12 ×3 −12 ×3 −12)

−12 then ×3

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c. 125, 25, 35, 7, 17, $3\frac{2}{5}$

÷5 +10 ÷5 +10 ÷5

÷5 then +10

5. a. 4, 7, 11, 16, 22

+3 +4 +5 +6

+1 +1 +1

22 + 7 = 29
29 + 8 = 37
37 + 9 = 46
46 + 10 = 56
56 + 11 = 67

29, 37, 46, 56, 67

b. 31, 30, 36, 35, 41

−1 +6 −1 +6

41 − 1 = 40
40 + 6 = 46
46 − 1 = 45
45 + 6 = 51
51 − 1 = 50

40, 46, 45, 51, 50

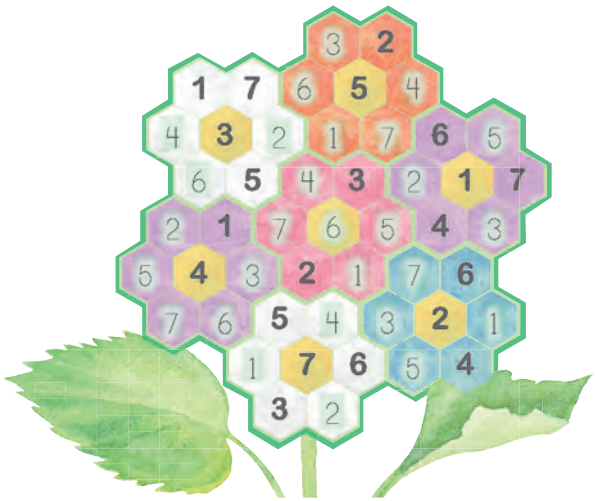
c. 4, 6, 12, 14, 28

+2 ×2 +2 ×2

28 + 2 = 30
30 × 2 = 60
60 + 2 = 62
62 × 2 = 124
124 + 2 = 126

30, 60, 62, 124, 126

6.



Review

1. a. $\frac{8}{m} = \frac{48}{54}$ (÷ 6 above, ÷ 6 below)

m = 9

b. $\frac{88}{33} = \frac{8}{n}$ (÷ 11 above, ÷ 11 below)

n = 3

2. a. 45 ÷ 2 = 22.5
50% of 45 = 22.5

b. 1.1 × 22

$$\begin{array}{r} 22 \\ \times\ 1.1 \\ \hline 22 \\ +220 \\ \hline 24.2 \end{array}$$

110% of 22 = 24.2

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3. area of top rectangle: 20 cm × 4 cm = 80 cm^2
area of bottom rectangle: 20 cm × 4 cm = 80 cm^2
area of left rectangle: 4 cm × 16 cm = 64 cm^2
area of right rectangle: 4 cm × 16 cm = 64 cm^2
area of front rectangle: 20 cm × 16 cm = 320 cm^2
area of back rectangle: 20 cm × 16 cm = 320 cm^2

surface area of the rectangular prism: 80 cm^2 + 80 cm^2 + 64 cm^2 + 64 cm^2 + 320 cm^2 + 320 cm^2 = 928 cm^2

4.
$$\begin{array}{r} 5.04 \\ \times\ \ 2.1 \\ \hline 504 \\ +10080 \\ \hline 10.584 \end{array}$$

10.584

5.
$$\begin{array}{r} {\scriptstyle 8\ \ 1} \\ 3.8\not{9}0 \\ -1.523 \\ \hline 2.367 \end{array}$$

2.367

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LINE PLOTS, STEM AND LEAF PLOTS, AND PICTOGRAPHS

Practice

1. a. 3

   b. 4

   c. 1

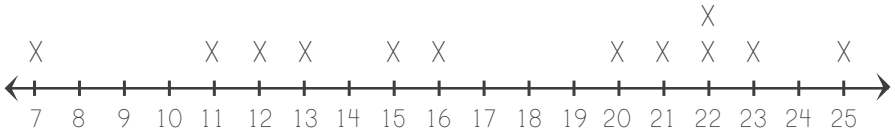
   d. 7, 8, 9, and 10

   e. 1, 13

   f. 9 (most X's)

   g. 13 − 1 = 12

2. Desert Precipitation over Twelve Months in Millimeters



3. a. 60s: 3 70s: 2 80s: 2 90s: 2 100s: 3

   b. 64 + 65 + 69 + 73 + 75 + 81 + 84 + 97 + 97 + 100 + 104 + 105 = 1,014
   There are 12 numbers.

```
     84.5
12)1,014.0
  - 96
    54
   -48
     60
    -60
      0
```

   mean: 84.5

   64, 65, 69, 73, 75, 81, 84, 97, 97, 100, 104, 105
   81 + 84 = 165
   There are 2 numbers.
   165 ÷ 2 = 82.5
   median: 82.5

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64, 65, 69, 73, 75, 81, 84, 97, 97, 100, 104, 105
mode: 97

64, 65, 69, 73, 75, 81, 84, 97, 97, 100, 104, 105
105 − 64 = 41
range: 41

4. **Length of Armadillo Lizards in Millimeters**

Stem	Leaf
5	3
6	6
7	4
8	1
9	4 6 9 9
10	1 4

53 + 66 + 74 + 81 + 94 + 96 + 99 + 99 + 101 + 104 = 867
There are 10 numbers.
867 ÷ 10 = 867 ÷ 10 = 86.7
mean: 86.7

53, 66, 74, 81, 94, 96, 99, 99, 101, 104
94 + 96 = 190
There are 2 numbers.
190 ÷ 2 = 95
median: 95

53, 66, 74, 81, 94, 96, 99, 99, 101, 104
mode: 99

53, 66, 74, 81, 94, 96, 99, 99, 101, 104
104 − 53 = 51
range: 51

5. a. desert horned lizard
1 × 10 = 10

darkling beetle
7 × 10 = 70
$\frac{1}{2}$ of 10 = 5
70 + 5 = 75

desert tortoise
1 × 10 = 10
$\frac{1}{2}$ of 10 = 5
10 + 5 = 15

wolf spider
10 × 10 = 100

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b. 10 + 15 + 75 + 100 = 200
There are 4 numbers.
200 ÷ 4 = 50
mean: 50

10, 15, 75, 100
100 − 10 = 90
range: 90

6. Answers will vary. This is one example.

Length of Desert Trails in the US

Chesler Park Loop Trail	
Dry Creek Vista Trail	
Alkali Flat Trail	
Telescope Peak Trail	
Calico Hills Trail	

= 2 miles

Review

1. 3, 11, 19, 27
+8 +8 +8

27 + 8 = 35
35 + 8 = 43
43 + 8 = 51
51 + 8 = 59

35, 43, 51, 59
rule: +8

2. a. $4 \div \frac{4}{7} = \frac{4}{1} \div \frac{4}{7} = \frac{4}{1} \times \frac{7}{4} = \frac{\overset{1}{\cancel{4}}}{1} \times \frac{7}{\underset{1}{\cancel{4}}} = \frac{7}{1} = 7$

b. $\frac{7}{9} \div 7 = \frac{7}{9} \div \frac{7}{1} = \frac{7}{9} \times \frac{1}{7} = \frac{\overset{1}{\cancel{7}}}{9} \times \frac{1}{\underset{1}{\cancel{7}}} = \frac{1}{9}$

3. a. 0.42 × 12

$$\begin{array}{r} 0.42 \\ \times\ \ 12 \\ \hline 84 \\ +\,4\,20 \\ \hline 5.04 \end{array}$$

42% of 12 = 5.04

b. 758 ÷ 10 = 758 ÷ 10 = 75.8
10% of 758 = 75.8

4.

Time	Interval	
6:30 AM	start time	
6:30 PM	12 hr	] 14 hr
8:30 PM	2 hr	
9:00 PM	30 min	] 58 min
9:28 PM	28 min	

end time: 9:28 PM

5. circle: $\odot O$

3 radii: $\overline{PO}$, $\overline{NO}$, $\overline{QO}$ (or those letters reversed)

diameter: $\overline{PN}$ or $\overline{NP}$

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CIRCLE GRAPHS AND HISTOGRAMS

Practice

1. a. Group F

b. Group A

c. Group B: 39, Group C: 40, Group D: 42,
Group E: 65, Group F: 80
5 groups

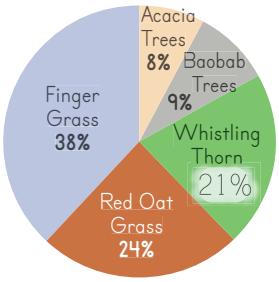
d. Group F has 80 baboons. Half of 80 is 40.
Group C

e. Group A + Group B: 18 + 39 = 57 baboons
Group D: 42 baboons
57 > 42
Groups A and B

f. 18 + 39 + 40 + 42 + 65 + 80 = 284

2. Missing sector:
100% − 8% − 9% − 24% − 38% = 21%

Grassland Plants



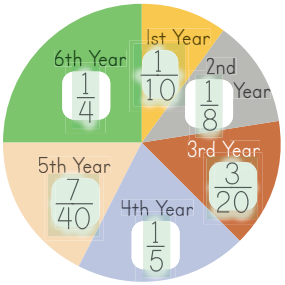
a. 8% × 3 = 24%
red oat grass

b. trees: 8% + 9% + 21% = 38%

c. grasses: 38% + 24% = 62%

3. Work for each year is shown below.

Ostrich Eggs Laid Each Year



total number of eggs:
8 + 10 + 12 + 16 + 14 + 20 = 80

1st year: $\frac{8}{80} \div \frac{8}{8} = \frac{1}{10}$

2nd year: $\frac{10}{80} \div \frac{10}{10} = \frac{1}{8}$

3rd year: $\frac{12}{80} \div \frac{4}{4} = \frac{3}{20}$

4th year: $\frac{16}{80} \div \frac{16}{16} = \frac{1}{5}$

5th year: $\frac{14}{80} \div \frac{2}{2} = \frac{7}{40}$

6th year: $\frac{20}{80} \div \frac{20}{20} = \frac{1}{4}$

4. a. feet

b. Lengths of Adult Black Mambas

c. 3 feet (6, 7, or 8 feet; 9, 10, or 11 feet; and 12, 13, or 14 feet)

d. 6–8 feet

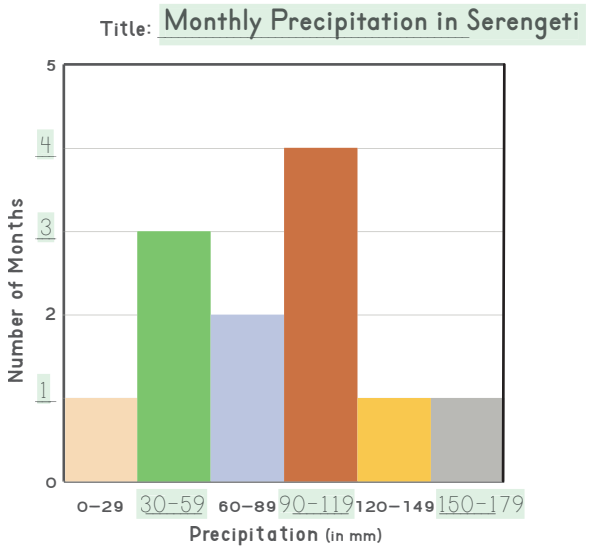
e. 6 + 5 = 11

f. 9–11 feet: 5 mambas
12–14 feet: 3 mambas
5 − 3 = 2

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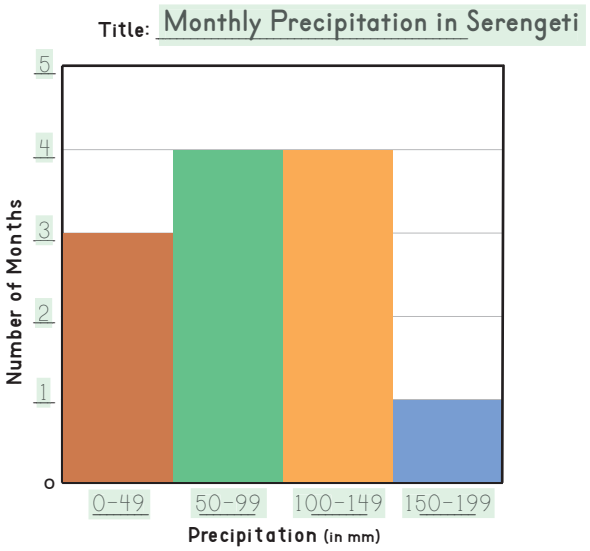
5.

Precipitation (in mm)	Frequency
0–29	|
30–59	|||
60–89	||
90–119	||||
120–149	|
150–179	|



6.

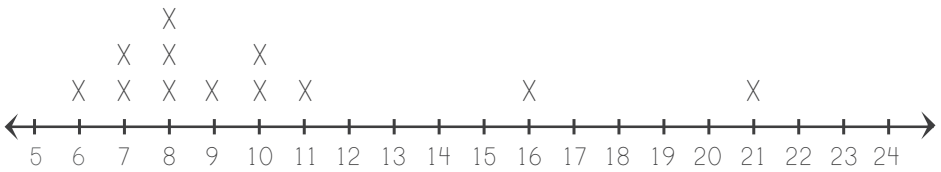
Precipitation (in mm)	Frequency
0–49	|||
50–99	||||
100–149	||||
150–199	|



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Review

1. Weight of Adult Cats (in lb)



a. 6–11

b. 16, 21

2. $\frac{1 \text{ cm}}{81 \text{ mi}} = \frac{6 \text{ cm}}{x}$ (× 6)

$x =$ 486 mi

3. a. 15, 9, 18, 12, 24, 18
−6 ×2 −6 ×2 −6

$18 \times 2 = 36$
$36 - 6 = 30$
$30 \times 2 = 60$

36, 30, 60

b. 196, 169, 144, 121
14^2 13^2 12^2 11^2

$10^2 = 100$
$9^2 = 81$
$8^2 = 64$

100, 81, 64

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ORGANIZING AND ANALYZING DATA

Practice

1. Answers will vary. Students should have created a survey question that is phrased in a way that does not include bias. An example is given below.

   Out of these holidays, which is your favorite: Valentine's Day, New Year's Eve, Independence Day, Thanksgiving, or Christmas?

2. Answers will vary. Students should have identified the population and sample for their survey question. An example is given below.

   Population: my church youth group Sample: 20 members of my church youth group

3. Answers will vary. Students should have created a chart for recording the results of their survey. An example is given below.

Favorite Holiday	Frequency
Valentine's Day	|
New Year's Eve	||||
Independence Day	|
Thanksgiving	|||
Christmas	𝍸 𝍸 |

4. Answers will vary. Students should have created a graph or plot to display the results of their survey. An example of a pictograph is given below.

Favorite Holiday

Valentine's Day	◖
New Year's Eve	● ●
Independence Day	◖
Thanksgiving	● ◖
Christmas	● ● ● ● ● ◖

● = 2 people

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EXPRESSIONS AND EQUATIONS

Video Lesson

Top Box

$m + 17$

s^2

$5y$ or $5 \times y$

Bottom Box

$k + 12 = 20$

$\sqrt{r} = 4$

$1 + 5p = 26$ or $1 + 5 \times p = 26$

Practice

1. Expression:

math phrase
no equal sign
cannot be solved

Examples:

$x + 4$
$6y$

Equation:

math sentence
has an equal sign
can be solved

Examples:

$x + 4 = 5$
$6y = 48$

2. a. (given)

b. $y - 20 = 4$ EQ

c. $\frac{u}{42}$ EX

d. $16 - w$ EX

e. $\frac{8}{r} = 2$ EQ

f. $29 = g + 13$ EQ

3. a. $g = 10$ (given)
$g = 4$ $18 + 4 = 22$

b. $p = 8$ $12 \times 8 = 96$
$p = 12$ $12 \times 12 = 144$

c. $m = 3$ $\frac{36}{3} = 12$
$m = 6$ $\frac{36}{6} = 6$

d. $f = 21$ $21 - 14 = 7$
$f = 30$ $30 - 14 = 16$

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4.

Words	Operation	Expression
a number divided by five	÷	$n \div 5$ or $\frac{n}{5}$
the sum of four and a number	+	$4 + n$
the difference between a number and nine	−	$n - 9$
the product of eleven and a number	×	$11n$ or $11 \times n$
the quotient of thirty-six and a number	÷	$36 \div n$ or $\frac{36}{n}$

5. Answers will vary. The value of each expression and sample answers are given.

a. (given)

b. 15: $13 + 2$, 3×5

c. 52: $60 - 8$, $104 \div 2$

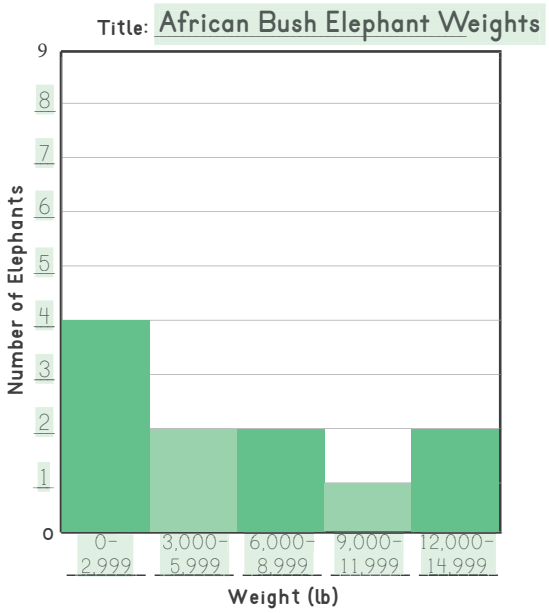
d. 42: 7×6, $40 + 2$

6. Answers will vary.

Review

1.

Intervals (in lb)	Frequency
0–2,999	||||
3,000–5,999	||
6,000–8,999	||
9,000–11,999	|
12,000–14,999	||



2. a. $0.75 = \frac{75}{100} = \frac{3}{4}$

b. $0.03 = \frac{3}{100}$

c. $65\% = \frac{65}{100} = \frac{13}{20}$

d. $20\% = \frac{20}{100} = \frac{1}{5}$

3. $\frac{3}{5} \times \frac{1}{4} \times \frac{5}{6} \times \frac{8}{11} = \frac{\cancel{3}^{1}}{\cancel{5}_{1}} \times \frac{1}{\cancel{4}_{1}} \times \frac{\cancel{5}^{1}}{\cancel{6}_{\cancel{2}_{1}}} \times \frac{\cancel{8}^{\cancel{2}^{1}}}{11} = \frac{1}{11}$

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SOLVING EQUATIONS

Video Lesson

Left Box

$w - 62 = 26$
$w = 26 + 62$
$w = 88$

Right Box

$g^2 = 121$
$g = \sqrt{121}$
$g = 11$

Practice

1. a. $11 + 28 = 39$

b. $k - 12 = 6$

c. $13 \times 10 = 130$

d. $\frac{1}{5} \times k = 20$ or $\frac{1}{5}k = 20$ or $\frac{k}{5} = 20$

2.

Operation	÷	+	×	$\sqrt{n}$	−	n^2
Inverse Operation	×	−	÷	n^2	+	$\sqrt{n}$

3. a. (given)

b. $18 \times 5 = 90$ or $5 \times 18 = 90$

c. $67 + 17 = 84$ or $17 + 67 = 84$

d. $13^2 = 169$

e. $\sqrt{36} = 6$

f. $60 \div 4 = 15$ or $60 \div 15 = 4$

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4. a. $y - 9 = 22$
$22 + 9 = y$
$y = 31$

b. $15 + r = 32$
$32 - 15 = r$
$r = 17$

c. $s \div 4 = 42$
$42 \times 4 = s$
$s = 168$

d. $6h = 72$
$\frac{72}{6} = h$
$h = 12$

e. $\sqrt{a} = 12$
$12^2 = a$
$a = 144$

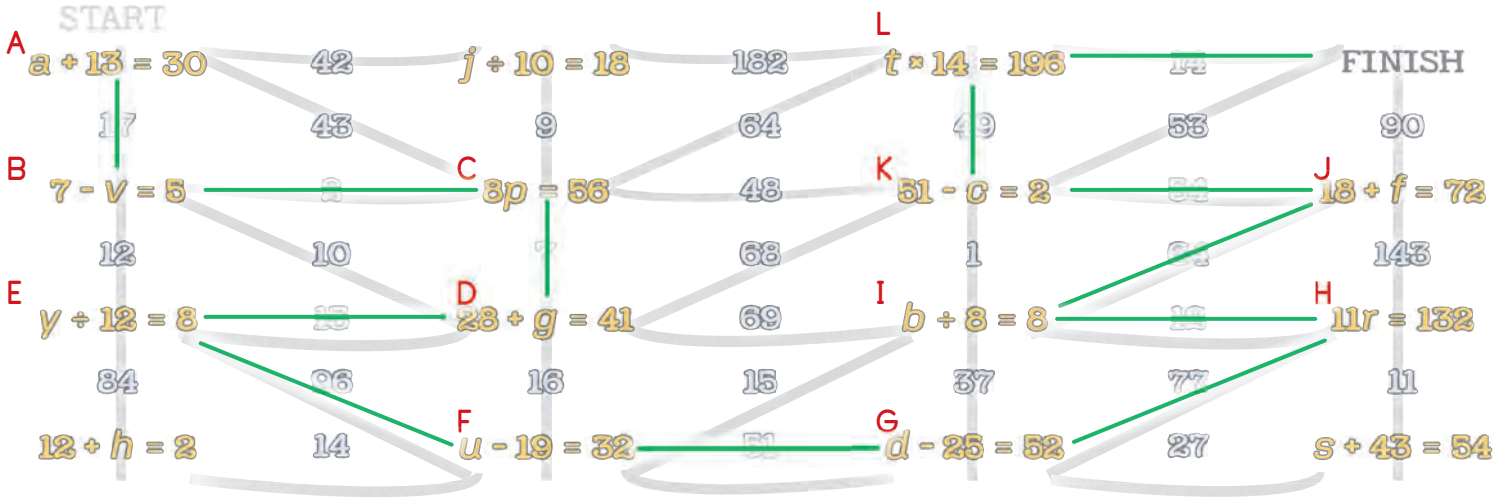
f. $p^2 = 100$
$\sqrt{100} = p$
$p = 10$

5. a. (given)

b. $42 \div 7 \stackrel{?}{=} 7$
$6 \neq 7$ ✗

c. $16 \times 3 \stackrel{?}{=} 48$
$48 = 48$ ✓

6. Work for each problem is shown below.



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A $a + 13 = 30$
$30 - 13 = a$
$a = 17$

B $7 - v = 5$
$7 = 5 + v$
$7 - 5 = v$
$v = 2$

C $8p = 56$
$\frac{56}{8} = p$
$p = 7$

D $28 + g = 41$
$41 - 28 = g$
$g = 13$

E $y \div 12 = 8$
$12 \times 8 = y$
$y = 96$

F $u - 19 = 32$
$32 + 19 = u$
$u = 51$

G $d - 25 = 52$
$52 + 25 = d$
$d = 77$

H $11r = 132$
$\frac{132}{11} = r$
$r = 12$

I $b \div 8 = 8$
$8 \times 8 = b$
$b = 64$

J $18 + f = 72$
$72 - 18 = f$
$f = 54$

K $51 - c = 2$
$51 = 2 + c$
$51 - 2 = c$
$c = 49$

L $t \times 14 = 196$
$196 \div 14 = t$
$t = 14$

Review

1. **Greenland's Average High Temperatures in °F**

Stem	Leaf
1	9
2	0 1 4 8 8
3	4 7
4	1 8 8
5	5

19, 20, 21, 24, 28, 28, 34, 37, 41, 48, 48, 55
$28 + 34 = 62$
There are 2 numbers.
$62 \div 2 = 31$
median: 31

19, 20, 21, 24, 28, 28, 34, 37, 41, 48, 48, 55
mode: 28 and 48

19, 20, 21, 24, 28, 28, 34, 37, 41, 48, 48, 55
$55 - 19 = 36$
range: 36

2. a. $5\% + 10\% = 15\%$

b. strawberries

c. 25% of 20 =
$20 \div 4 = 5$

CONVERTING FRACTIONS, DECIMALS, AND PERCENTS

Practice

1. a. $\frac{1}{2} = 0.5$

b. $8\overline{)7.0^{6}0^{4}0}\ = 0.875$

$\frac{7}{8} = 0.875$

c. $20\overline{)13.0^{10}0}\ = 0.65$

$\frac{13}{20} = 0.65$

2. a. $0.11 \longrightarrow 0.11\%$
$0.11 = 11\%$

b. $0.04 \longrightarrow 0.04\%$
$0.04 = 4\%$

c. $1.57 \longrightarrow 1.57\%$
$1.57 = 157\%$

3. a. $69\% \longrightarrow 69\% \longrightarrow 0.69$
$69\% = 0.69$

b. $8\% \longrightarrow 08\% \longrightarrow 0.08$
$8\% = 0.08$

c. $103\% \longrightarrow 103\% \longrightarrow 1.03$
$103\% = 1.03$

4. a. $0.37 = \frac{37}{100}$

b. $0.6 = \frac{6}{10} = \frac{3}{5}$ (÷ 2)

c. $0.152 = \frac{152}{1{,}000} = \frac{19}{125}$ (÷ 8)

5. a. $\frac{1}{5} = \frac{20}{100} = 20\%$ (× 20)

b. $\frac{11}{20} = \frac{55}{100} = 55\%$ (× 5)

c. $8\overline{)1.0^{2}0^{4}0}\ = 0.125$

$\frac{1}{8} = 0.125$

$0.125 \longrightarrow 0.125\% \longrightarrow 12.5\%$

6. a. 48% is 48 parts out of 100
$\frac{48}{100} = \frac{12}{25}$

b. 5% is 5 parts out of 100
$\frac{5}{100} = \frac{1}{20}$

c. 60% is 60 parts out of 100
$\frac{60}{100} = \frac{3}{5}$

7. Work for each problem is shown on the next page.

A	$\frac{4}{5}$	0.32	87.5%
B	$\frac{1}{10}$	0.1	9%
C	$\frac{8}{25}$	0.875	80%
D	$\frac{7}{40}$	0.09	17.5%
E	$\frac{7}{8}$	0.175	32%
F	$\frac{9}{100}$	0.8	10%

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A (given)

B $\frac{1}{10} = 0.1$

$0.1 \longrightarrow 0.10\% \longrightarrow 10\%$

C $\frac{8}{25} = \frac{32}{100} = 0.32$

$0.32 \longrightarrow 0.32\% \longrightarrow 32\%$

D $40\overline{)7.0^{30}0^{20}0}$ $\quad 0.1\ 7\ 5$

$\frac{7}{40} = 0.175$

$0.175 \longrightarrow 0.175\% \longrightarrow 17.5\%$

E $8\overline{)7.0^{6}0^{4}0}$ $\quad 0.8\ 7\ 5$

$\frac{7}{8} = 0.875$

$0.875 \longrightarrow 0.875\% \longrightarrow 87.5\%$

F $\frac{9}{100} = 0.09$

$0.09 \longrightarrow 0.09\% \longrightarrow 9\%$

8. a. $11\% = \frac{11}{100}$

$\frac{11}{100} = 11\%$

b. $\frac{1}{20} = \frac{5}{100} = 5\%$

$\frac{1}{20} = 5\%$

c. $1.112 \longrightarrow 1.112\% \longrightarrow 111.2\%$

$111.2\% < 112\%$

$1.112 < 112\%$

d. $35\% = \frac{35}{100}$

$\frac{35}{100} = \frac{105}{300}$

$\frac{1}{3} = \frac{100}{300}$

$\frac{105}{300} > \frac{100}{300}$

$35\% > \frac{1}{3}$

9. a. (given)

b. decimal: $15\% \longrightarrow 15\% \longrightarrow 0.15$

c. fraction: $0.7 = \frac{7}{10}$

percent: $0.7 \longrightarrow 0.70\% \longrightarrow 70\%$

d. decimal: $45\% \longrightarrow 45\% \longrightarrow 0.45$

e. fraction: $0.25 = \frac{25}{100} = \frac{1}{4}$

f. percent: $\frac{3}{4} = \frac{75}{100} = 75\%$

decimal: $75\% \longrightarrow 75\% \longrightarrow 0.75$

10. a. $\frac{2}{5} = \frac{40}{100} = 40\%$

$100\% - 40\% = 60\%$

60% of the customers

b. 12% is 12 parts per hundred

$\frac{12}{100} = \frac{3}{25}$

$1 - \frac{3}{25} =$

$\frac{25}{25} - \frac{3}{25} = \frac{22}{25}$

$\frac{22}{25}$ of the donut orders

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Review

1. a. $7d = 42$

$\frac{42}{7} = d$

$d = 6$

b. $p^2 = 169$

$\sqrt{169} = p$

$p = 13$

2.
$$\begin{array}{r} {}^{4} \\ 280 \\ \times\ 0.05 \\ \hline 14.00 \end{array}$$

5% of 280 = 14

3. a. $\frac{45}{81} = \frac{x}{9}$ (÷ 9 above, ÷ 9 below)

$x = 5$

b. $\frac{3}{14} = \frac{24}{y}$ (× 8 above, × 8 below)

$y = 112$

4. least to greatest: 7.3, 8.9, 8.9, 10.3, 12, 12

7.3 + 8.9 + 8.9 + 10.3 + 12 + 12 = 59.4

There are 6 numbers.

$$6\overline{)59.^{5}4}\quad 9.9$$

mean: 9.9

7.3, 8.9, 8.9, 10.3, 12, 12

8.9 + 10.3 = 19.2

There are 2 numbers.

$$2\overline{)19.^{1}2}\quad 9.6$$

median: 9.6

7.3, 8.9, 8.9, 10.3, 12, 12

mode: 8.9 and 12

7.3, 8.9, 8.9, 10.3, 12, 12

12 − 7.3 = 4.7

range: 4.7

5. $6\frac{2}{3} - 3\frac{3}{10} =$

$6\frac{20}{30} - 3\frac{9}{30} = 3\frac{11}{30}$

6.
$$\begin{array}{r} {}^{2}\not{4}\ {}^{1} \\ 0.352 \\ \times\quad 4.5 \\ \hline 1760 \\ +\,1\,4080 \\ \hline 1.5840 \end{array}$$

4.5 × 0.352 = 1.584

7. a. 4 c = 1 qt

12 ÷ 4 = 3

12 c = 3 qt

b. 820 ÷ 1,000 = 0.820

820 mL = 0.82 L

8. -3 82 ~~4.5~~ ~~$\frac{6}{7}$~~ ~~-0.2~~ 0

Natural Numbers	Whole Numbers	Integers
82	0, 82	-3, 0, 82

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BASE-5 NUMBER SYSTEM

Practice

1. a. 0, 1, 2, 3, 4, 5, 6, 7, 8, 9

b. 0, 1, 2, 3, 4

2. a.
$$\begin{array}{r} 32 \\ -25 \\ \hline 7 \end{array}$$ There is one 25.

$$\begin{array}{r} -5 \\ \hline 2 \end{array}$$ There is one 5.

$$\begin{array}{r} -2 \\ \hline 0 \end{array}$$ There are two 1s.

base-5 place values	125	25	5	1
how many of each place value	0	1	1	2

$32_{10} = 112_5$

b.
$$\begin{array}{r} 146 \\ -125 \\ \hline 21 \end{array}$$ There is one 125.

There are no 25s.

$$\begin{array}{r} -20 \\ \hline 1 \end{array}$$ There are four 5s.

$$\begin{array}{r} -1 \\ \hline 0 \end{array}$$ There is one 1.

base-5 place values	125	25	5	1
how many of each place value	1	0	4	1

$146_{10} = 1041_5$

c.
$$\begin{array}{r} 264 \\ -250 \\ \hline 14 \end{array}$$ There are two 125s.

There are no 25s.

$$\begin{array}{r} -10 \\ \hline 4 \end{array}$$ There are two 5s.

$$\begin{array}{r} -4 \\ \hline 0 \end{array}$$ There are four 1s.

base-5 place values	125	25	5	1
how many of each place value	2	0	2	4

$264_{10} = 2024_5$

3. a.

base-5 digits		2	1	4
base-5 place values	125	25	5	1

$(2 \times 25) + (1 \times 5) + (4 \times 1) =$
$50 + 5 + 4 =$
59

$214_5 = 59_{10}$

b.

base-5 digits	1	2	0	3
base-5 place values	125	25	5	1

$(1 \times 125) + (2 \times 25) + (0 \times 5) + (3 \times 1) =$
$125 + 50 + 0 + 3 =$
178

$1203_5 = 178_{10}$

c.

base-5 digits	3	0	4	4
base-5 place values	125	25	5	1

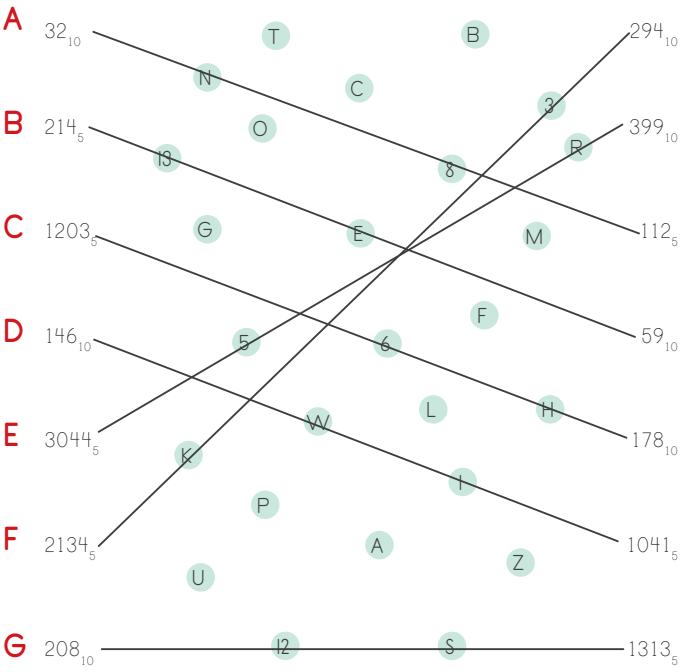
$(3 \times 125) + (0 \times 25) + (4 \times 5) + (4 \times 1) =$
$375 + 0 + 20 + 4 =$
399

$3044_5 = 399_{10}$

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4. Work for each new problem is shown below.

Why was the equal sign so humble?



H E K N E W H E W A S N T
6 13 3 8 13 1 6 13 1 12 8

L E S S T H A N O R G R E A T E R
13 12 12 6 8 5 5 13 13 5

T H A N A N Y O N E E L S E.
6 8 8 8 13 13 12 13

A See Problem 2A on the previous page.

B See Problem 3A on the previous page.

C See Problem 3B on the previous page.

D See Problem 2B on the previous page.

E See Problem 3C on the previous page.

F

base-5 digits	2	1	3	4
base-5 place values	125	25	5	1

$(2 \times 125) + (1 \times 25) + (3 \times 5) + (4 \times 1) =$
$250 + 25 + 15 + 4 =$
294

$2134_5 = 294_{10}$

G

208
-125 There is one 125.
83
-75 There are three 25s.
8
-5 There is one 5.
3
-3 There are three 1s.
0

base-5 place values	125	25	5	1
how many of each place value	1	3	1	3

$208_{10} = 1313_5$

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Review

1. a. $r - 16 = 12$
$12 + 16 = r$
$r = 28$

b. $63 \div s = 7$
$7 \times s = 63$
$63 \div 7 = s$
$s = 9$

c. $\sqrt{m} = 13$
$13^2 = m$
$m = 169$

2. a. $20\overline{)7.0^{10}0}$ $\quad 0.35$

$0.35 \longrightarrow 0.35\% \longrightarrow 35\%$

$\frac{7}{20} = 0.35 = 35\%$

b. $8\overline{)1.0^{2}0^{4}0}$ $\quad 0.125$

$0.125 \longrightarrow 0.125\% \longrightarrow 12.5\%$

$\frac{1}{8} = 0.125 = 12.5\%$

3. $\frac{9}{10} + \frac{5}{6}$
$= \frac{27}{30} + \frac{25}{30}$
$= \frac{52}{30}$
$= 1\frac{22}{30} = 1\frac{11}{15}$

4. 0.08430 (least) 0.08500 (greatest) 0.08432 (middle)

0.085, 0.08432, 0.0843

5. $59 \times 9 = (60 - 1) \times 9 = (60 \times 9) - (1 \times 9) =$
$540 - 9 = 531$

6. $\frac{\cancel{7}^{1}}{\cancel{10}_{5}} \times \frac{\cancel{9}^{3}}{\cancel{14}_{2}} \times \frac{\cancel{2}^{1}}{\cancel{3}_{1}} = \frac{3}{10}$

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ROMAN NUMERALS

Practice

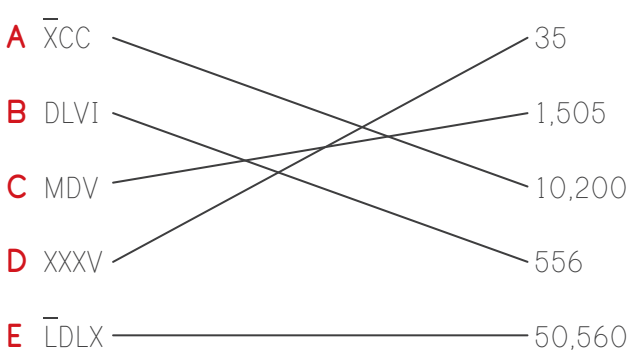
1. {L, C, T, M, E}
{C, I, V, D, X, L, M}

{A, B, C, D, E}
{I, V, D, E, X, L, C}

2. I, V, X, L, C, D, M

3. V, X, XV, XX, XXV, XXX, XXXV, XL, XLV, L, LV, LX, LXV, LXX, LXXV, LXXX, LXXXV, XC, XCV, C

4. Work for each problem is shown below.



A X̄CC =
X̄ + CC =
10,000 + (100 + 100) =
10,000 + 200 =
10,200

B DLVI =
D + L + V + I
500 + 50 + 5 + 1 =
556

C MDV =
M + D + V =
1,000 + 500 + 5 =
1,505

D XXXV =
XXX + V =
(10 + 10 + 10) + 5 =
30 + 5 =
35

E L̄DLX =
L̄ + D + L + X =
50,000 + 500 + 50 + 10 =
50,560

5. a. 354 = 300 + 50 + 4 = CCC + L + IV = CCCLIV

b. 809 = 500 + 300 + 9 = D + CCC + IX = DCCCIX

c. 2,013 = 2,000 + 10 + 3 = MM + X + III = MMXIII

d. 15,010 = 10,000 + 5,000 + 10 = X̄ + V̄ + X = X̄V̄X

6. a. MC =
M + C =
1,000 + 100 =
1,100

b. L̄CDX =
L̄ + CD + X =
50,000 + (500 − 100) + 10 =
50,000 + 400 + 10 =
50,410

c. X̄LDVIII =
X̄L + D + VIII =
(50,000 − 10,000) + 500 + (5 + 1 + 1 + 1) =
40,000 + 500 + 8 =
40,508

d. M̄D =
M̄ + D =
1,000,000 + 500 =
1,000,500

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7. a. XII =
X + II =
10 + (1 + 1) =
10 + 2 =
12

XX =
X + X =
10 + 10 =
20

12 < 20
XII < XX

b. XCV =
XC + V =
(100 − 10) + 5 =
90 + 5 =
95

LXXXV =
L + XXX + V =
50 + (10 + 10 + 10) + 5 =
50 + 30 + 5 = 85

95 > 85
XCV > LXXXV

c. LV =
L + V =
50 + 5 = 55

L = 50

55 > 50
LV > L

8. a. M − D =
1,000 − 500 =
500

b. X + V + C =
10 + 5 + 100 =
115

c. $\overline{C}$ × C =
100,000 × 100 =
10,000,000

d. $\overline{D}$ ÷ D =
500,000 ÷ 500 =
1,000

9. a. Answers will vary. An example is given.

current year: 2026 = 2,000 + 20 + 6 = MM + XX + VI = MMXXVI

b. Answers will vary.

Review

1. a. $54 \div c = 9$
$54 \div 9 = c$
$c = 6$

b. $12d = 144$
$\frac{144}{12} = d$
$d = 12$

2. Work for each problem is shown on the next page.

Fraction	Decimal	Percent
A $\frac{3}{5}$	0.6	60%
B $\frac{9}{20}$	0.45	45%
C $\frac{49}{50}$	0.98	98%

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A $5\overline{)3.0}$ → 0.6

0.6 → 0.60% → 60%

B $0.45 = \frac{45}{100} = \frac{9}{20}$ (÷ 5, ÷ 5)

0.45 → 0.45% → 45%

C 98% → 98% → 0.98

$0.98 = \frac{98}{100} = \frac{49}{50}$ (÷ 2, ÷ 2)

3.

Time	Interval	
10:18 AM	start time	
3:18 PM	5 hr	5 hr
4:00 PM	42 min	
4:06 PM	6 min	48 min

elapsed time: 5 hr 48 min

4. a. 3,420 ÷ 1,000 = 3.420

3,420 mL = 3.42 L

b. 2 pt = 1 qt

7 × 2 = 14

7 qt = 14 pt

5. 75% of 32

$$\begin{array}{r} {\scriptstyle 2\ \ 1} \\ 0.75 \\ \times\ \ 32 \\ \hline 150 \\ +2250 \\ \hline 24.00 \end{array}$$

number of children eating ice cream sundaes: 24

32 − 24 = 8

number of children eating ice cream cones: 8

24 − 8 = 16

16 children

6. $r = 6 \text{ yd} \div 2 = 3 \text{ yd}$

$V = \pi r^2 h$

$V \approx 3.14 \times (3 \text{ yd})^2 \times 30 \text{ yd}$

$V \approx 3.14 \times 9 \text{ yd}^2 \times 30 \text{ yd}$

$V \approx 3.14 \times 270 \text{ yd}^3$

$V \approx 847.8 \text{ yd}^3$

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COURSE REVIEW

1. a. $2^4 = 2 \times 2 \times 2 \times 2 = 16$

b. $15^0 = 1$

c. $3^3 = 3 \times 3 \times 3 = 27$

2. a. ten millions place
2,904,695,519.4925
round down
2,900,000,000

b. tenths place
2,904,695,519.4925
round up
2,904,695,519.5

3. a. $15^2 = 225$

b. $13^2 = 169$

c. $14^2 = 196$

d. $\sqrt{121} = 11$

e. $\sqrt{144} = 12$

f. $\sqrt{81} = 9$

4. a. $64{,}967 \div 10^4 = 64.967 \div 10^4 = 6.4967$

b. $8.275 \times 10^5 = 8.27500 \times 10^5 = 827{,}500$

5. a. $44 + 5 \times 4 \div 2^2 =$
$44 + 5 \times 4 \div 4 =$
$44 + 20 \div 4 =$
$44 + 5 =$
49

b. $(45 - 34) \times 3^2 - 9 =$
$11 \times 3^2 - 9 =$
$11 \times 9 - 9 =$
$99 - 9 =$
90

6. least to greatest: 3.5, 8.2, 8.2, 9, 10.1, 11.4

a. $3.5 + 8.2 + 8.2 + 9 + 10.1 + 11.4 = 50.4$
There are 6 numbers.

$$6\overline{)50.^{2}4} \quad 8.4$$

mean: 8.4

b. 3.5, 8.2, 8.2, 9, 10.1, 11.4
$8.2 + 9 = 17.2$
There are 2 numbers.
$17.2 \div 2 = 8.6$
median: 8.6

c. 3.5, 8.2, 8.2, 9, 10.1, 11.4
mode: 8.2

d. 3.5, 8.2, 8.2, 9, 10.1, 11.4
$11.4 - 3.5 = 7.9$
range: 7.9

7. a. $\frac{5}{8}$: Half of 8 is 4. 5 is greater than 4, so $\frac{5}{8} > \frac{1}{2}$.

$\frac{2}{9}$: Half of 9 is $4\frac{1}{2}$. 2 is less than $4\frac{1}{2}$, so $\frac{2}{9} < \frac{1}{2}$.

$\frac{6}{5}$: 6 is greater than 5, so $\frac{6}{5} > 1$.

Least to greatest: $\frac{2}{9}, \frac{1}{2}, \frac{5}{8}, \frac{6}{5}$

b. 9.5432, 9.5300, 9.5341, 9.5500, 9.4500

2nd greatest, 2nd smallest, middle, greatest, least

Least to greatest:
9.45, 9.53, 9.5341, 9.5432, 9.55

8. a. Half of 11 is $5\frac{1}{2}$. 3 is less than $5\frac{1}{2}$.
$\frac{3}{11}$ is less than $\frac{1}{2} \longrightarrow$ round down
$\frac{3}{11} \longrightarrow 0$

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b. Half of 10 is 5. 7 is greater than 5.

$\frac{7}{10}$ is greater than $\frac{1}{2}$ ⟶ round up

$\frac{7}{10}$ ⟶ 1

c. Half of 9 is $4\frac{1}{2}$. 8 is greater than $4\frac{1}{2}$.

$\frac{8}{9}$ is greater than $\frac{1}{2}$ ⟶ round up

$3\frac{8}{9}$ ⟶ 4

d. $\frac{29}{5} = 5\frac{4}{5}$

Half of 5 is $2\frac{1}{2}$. 4 is greater than $2\frac{1}{2}$.

$\frac{4}{5}$ is greater than $\frac{1}{2}$ ⟶ round up

$5\frac{4}{5}$ ⟶ 6

9. a. 200 × 10 = 2,000
200 cm = 2,000 mm

200 ÷ 100 = 2
200 cm = 2 m

2,000 mm = 200 cm = 2 m

b. 1 ft = 12 in
9 × 12 = 108
9 ft = 108 in

3 ft = 1 yd
9 ÷ 3 = 3
9 ft = 3 yd

108 in = 9 ft = 3 yd

c. 3 × 1,000 = 3,000
3 kg = 3,000 g

d. 1 lb = 16 oz
48 ÷ 16 = 3
48 oz = 3 lb

e. 32,405 ÷ 1,000 = 32.405
32,405 mL = 32.405 L

f. 1 qt = 2 pt
4 × 2 = 8
4 qt = 8 pt

10. a. area of top rectangle: 18 cm × 10 cm = 180 cm^2
area of bottom rectangle: 18 cm × 10 cm = 180 cm^2
area of front rectangle: 18 cm × 8 cm = 144 cm^2
area of back rectangle: 18 cm × 8 cm = 144 cm^2
area of left rectangle: 10 cm × 8 cm = 80 cm^2
area of right rectangle: 10 cm × 8 cm = 80 cm^2

surface area of rectangular prism:
180 cm^2 + 180 cm^2 + 144 cm^2 + 144 cm^2 + 80 cm^2 + 80 cm^2 = 808 cm^2

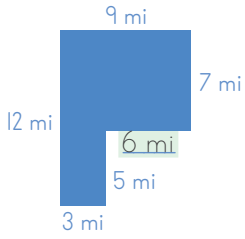
b. $V = \ell wh$
V = 18 cm × 10 cm × 8 cm
V = 180 cm^2 × 8 cm
V = 1,440 cm^3

11. a. $\frac{2}{6} = \frac{1}{3}$

b. $\frac{3}{6} = \frac{1}{2}$

c. $\frac{5}{6}$

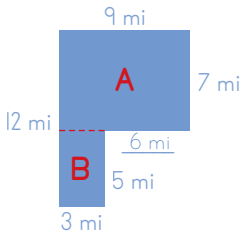
12. a. Length of missing side: 9 mi − 3 mi = 6 mi



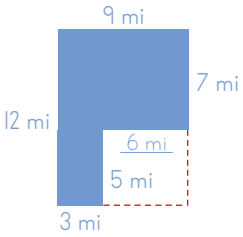
perimeter = 9 mi + 7 mi + 6 mi + 5 mi + 3 mi + 12 mi = 42 mi

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Work may vary. The area is shown using two different methods below.



Area A: 9 mi × 7 mi = 63 mi^2
Area B: 3 mi × 5 mi = 15 mi^2
Area of irregular shape: 63 mi^2 + 15 mi^2 = 78 mi^2



Area of large rectangle: 9 mi × 12 mi = 108 mi^2
Area of the empty space: 6 mi × 5 mi = 30 mi^2
Area of irregular shape:
108 mi^2 − 30 mi^2 = 78 mi^2

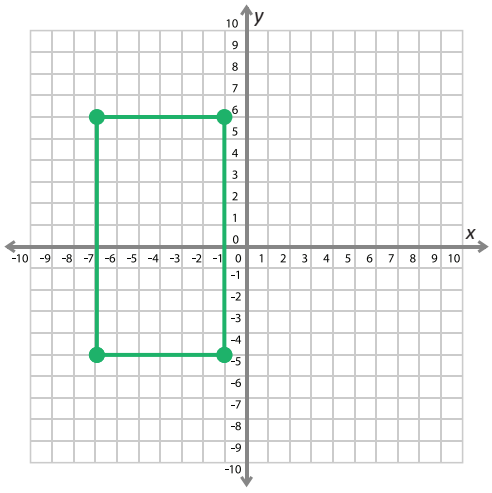
area = 78 mi^2

b. perimeter = 5 in + 13 in + 12 in = 30 in

$$\text{area} = \frac{12 \text{ in} \times 5 \text{ in}}{2} = \frac{60 \text{ in}^2}{2} = 30 \text{ in}^2$$

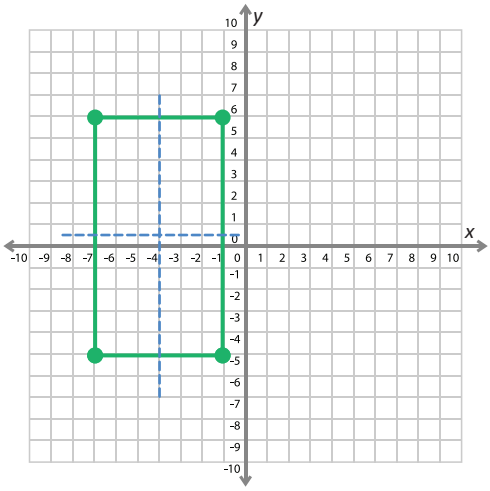
c. ∠A = 23°

13. a.

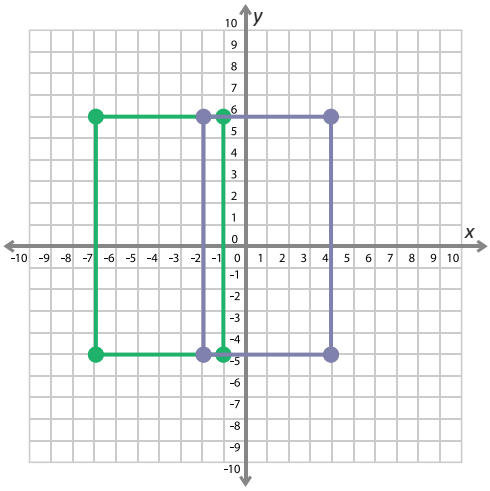


b. rectangle

c. Possible lines of symmetry are shown in blue.



d.



(4, −5), (−2, −5), (−2, 6), (4, 6)

14. Work may vary. Examples are given.

a. 9 × 78 =
9 × (80 − 2) =
(9 × 80) − (9 × 2) =
720 − 18 =
702

b. 59 × 7 =
(60 − 1) × 7 =
(7 × 60) − (7 × 1) =
420 − 7 =
413

15. a. moons to suns: $\frac{6}{3} = \frac{2}{1}$ or 2 : 1

b. suns to moons: $\frac{3}{6} = \frac{1}{2}$ or 1 : 2

16. a. $\frac{3}{4} + \frac{1}{3} + \frac{1}{6} = \frac{9}{12} + \frac{4}{12} + \frac{2}{12} = \frac{15}{12} = 1\frac{3}{12} = 1\frac{1}{4}$

b. $6\frac{5}{7} - 2\frac{2}{3} = 6\frac{15}{21} - 2\frac{14}{21} = 4\frac{1}{21}$

c. $\frac{10}{27} \div \frac{5}{3} = \frac{10}{27} \times \frac{3}{5} = \frac{\cancel{10}^{2}}{\underset{9}{\cancel{27}}} \times \frac{\cancel{3}^{1}}{\underset{1}{\cancel{5}}} = \frac{2}{9}$

d. $\frac{3}{5} \times 5 = \frac{\underset{1}{\cancel{3}}}{\cancel{5}} \times \frac{\cancel{5}^{1}}{1} = \frac{3}{1} = 3$

e. $1\frac{1}{2} \times 3\frac{2}{3} = \frac{3}{2} \times \frac{11}{3} = \frac{\cancel{3}^{1}}{2} \times \frac{11}{\underset{1}{\cancel{3}}} = \frac{11}{2} = 5\frac{1}{2}$

f. $\frac{7}{10} \times \frac{5}{14} \times \frac{4}{3} = \frac{\cancel{7}^{1}}{\underset{2}{\cancel{10}}} \times \frac{\cancel{5}^{1}}{\underset{2}{\cancel{14}}} \times \frac{\cancel{4}^{1}}{3} = \frac{1}{3}$

17. a. name the circle: ⊙Y

b. name 2 radii: $\overline{XY}$ and $\overline{ZY}$ (or the letters reversed)

c. name the diameter: $\overline{XZ}$ (or $\overline{ZX}$)

d. 10 ft

e. 10 ft × 2 = 20 ft

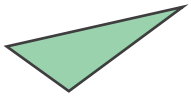
f. $C = \pi d$
$C \approx 3.14 \times 20$ ft
$C \approx 62.8$ ft
circumference ≈ 62.8 ft

g. $A = \pi r^2$
$A \approx 3.14 \times (10 \text{ ft})^2$
$A \approx 3.14 \times (10 \text{ ft} \times 10 \text{ ft})$
$A \approx 3.14 \times 100 \text{ ft}^2$
$A \approx 314 \text{ ft}^2$
area ≈ 314 ft^2

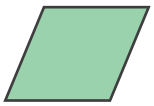
18. a. The figure should have one pair of parallel sides.



b. The triangle should have an obtuse angle and three sides of different lengths.



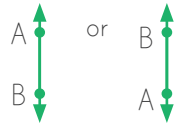
c. The figure should have two pairs of parallel sides and four sides of the same length.



19. measured distance: 5 cm

actual distance: $\frac{1 \text{ cm}}{300 \text{ ft}} \overset{\times 5}{=} \frac{5 \text{ cm}}{x}$ ($\times 5$)

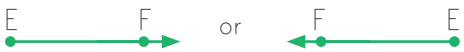
x = 1,500 ft

20. a. 

b. Orientation may vary.



c. Orientation may vary. Two examples are given below.



21. summer day:

Time	Interval	
5:56 AM	start time	
5:56 PM	12 hr	] 14 hr
7:56 PM	2 hr	
8:00 PM	4 min	] 56 min
8:52 PM	52 min	

elapsed time: 14 hr 56 min

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winter day:

Time	Interval	
7:48 AM	start time	9 hr
4:48 PM	9 hr	
5:00 PM	12 min	14 min
5:02 PM	2 min	

elapsed time: 9 hr 14 min

difference in daylight hours:
14 hr 56 min − 9 hr 14 min = 5 hr 42 min

22. a. $5\overline{)10.15}$ → 2.03

b. 98.64 ÷ 0.4 ⟶ 98.64 ÷ 0.4 ⟶ 986.4 ÷ 4

$4\overline{)986.4}$ → 246.6

c. 1.04 ÷ 0.9 ⟶ 1.04 ÷ 0.9 ⟶ 10.4 ÷ 9

$9\overline{)10.400}$ → 1.155... = $1.1\overline{5}$

-9
14
-9
50
-45
50
-45
5

23. a. 0.35 × 80

2 4
0.35
× 80
28.00

35% of 80 = 28

b. 0.04 × 60

60
× 0.04
2.40

4% of 60 = 2.4

c. 48 ÷ 4 = 12
25% of 48 = 12

d. 1.3 × 35

1
35
× 1.3
105
+350
45.5

130% of 35 = 45.5

24. a. −22, −18, −14, −10
+4 +4 +4

rule: +4

−10 + 4 = −6
−6 + 4 = −2
−2 + 4 = 2

−6, −2, 2

b. $\frac{1}{3}$, 1, 3, 9
×3 ×3 ×3

rule: ×3

9 × 3 = 27
27 × 3 = 81
81 × 3 = 243

27, 81, 243

c. 3, 5, 10, 12, 24
+2 ×2 +2 ×2

rule: +2 then ×2

24 + 2 = 26
26 × 2 = 52
52 + 2 = 54

26, 52, 54

25. a.
4.2500
+8.1027
12.3527

4.25 + 8.1027 = 12.3527

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b.
$$\begin{array}{r} {\scriptstyle 0\ 9\ 9\ 9} \\ 1\,\not{0}.\not{0}\not{0}{}^{1}0 \\ -\ 5.2\,4\,1 \\ \hline 4.7\,5\,9 \end{array}$$

$10 - 5.241 = 4.759$

c.
$$\begin{array}{r} {\scriptstyle 1} \\ 4.703 \\ \times\ \ 2.1 \\ \hline 4703 \\ +94060 \\ \hline 9.8763 \end{array}$$

$4.703 \times 2.1 = 9.8763$

26. Work for each problem is shown below.

	Fraction	Decimal	Percent
A	$\frac{5}{8}$	0.625	62.5%
B	$\frac{7}{20}$	0.35	35%
C	$\frac{17}{25}$	0.68	68%

A
$$\begin{array}{r} 0.625 \\ 8\overline{)\,5.0^{2}0^{4}0} \end{array}$$

$0.625 \longrightarrow 0.625\% \longrightarrow 62.5\%$

B $0.35 = \frac{35}{100} = \frac{7}{20}$ (÷ 5 above, ÷ 5 below)

$0.35 \longrightarrow 0.35\% \longrightarrow 35\%$

C $68\% \longrightarrow 68\% \longrightarrow 0.68$ (÷ 4)

$0.68 = \frac{68}{100} = \frac{17}{25}$ (÷ 4 below)

27. a. $a + 12 = 45$
$45 - 12 = a$
$a = 33$

b. $v - 24 = 13$
$13 + 24 = v$
$v = 37$

c. $8m = 64$
$\frac{64}{8} = m$
$m = 8$

d. $x \div 12 = 11$
$11 \times 12 = x$
$x = 132$

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COURSE ASSESSMENT

Exponents & Multiplying & Dividing by Powers of 10

1. a. $3^3 = 3 \times 3 \times 3 = 27$

   b. $2^5 = 2 \times 2 \times 2 \times 2 \times 2 = 32$

   c. $12^0 = 1$

   d. $86.32 \times 10^5 = 86.32000 \times 10^5 = 8{,}632{,}000$

   e. $9{,}450{,}172 \div 10^6 = 9.450172 \div 10^6 = 9.450172$

Exponents & Multiplying & Dividing by Powers of 10 Additional Practice

1. a. $2^4 = 2 \times 2 \times 2 \times 2 = 16$

   b. $13^0 = 1$

   c. $5^3 = 5 \times 5 \times 5 = 125$

   d. $757{,}100 \div 10^3 = 757.100 \div 10^3 = 757.1$

   e. $5.164 \times 10^4 = 5.1640 \times 10^4 = 51{,}640$

Perfect Squares & Square Roots

1. a. $9^2 = 81$

   b. $6^2 = 36$

   c. $13^2 = 169$

   d. $\sqrt{49} = 7$

   e. $\sqrt{121} = 11$

   f. $\sqrt{144} = 12$

Perfect Squares & Square Roots Additional Practice

1. a. $11^2 = 121$

   b. $8^2 = 64$

   c. $12^2 = 144$

   d. $\sqrt{16} = 4$

   e. $\sqrt{169} = 13$

   f. $\sqrt{64} = 8$

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Order of Operations

1. a. $28 + 5 \times 2 - 2^3 =$
$28 + 5 \times 2 - 8 =$
$28 + 10 - 8 =$
$38 - 8 =$
30

b. $3^2 \times (32 \div 4) + 11 =$
$3^2 \times 8 + 11 =$
$9 \times 8 + 11 =$
$72 + 11 =$
83

Order of Operations Additional Practice

1. a. $40 - (8 \times 10) \div 2^2 =$
$40 - 80 \div 2^2 =$
$40 - 80 \div 4 =$
$40 - 20 =$
20

b. $9 \times 2^3 - 12 \div 3 =$
$9 \times 8 - 12 \div 3 =$
$72 - 12 \div 3 =$
$72 - 4 =$
68

Mean, Median, Mode & Range

1. a. 3, 3, 4.3, 5.1, 7.1, 9.3

b. $3 + 3 + 4.3 + 5.1 + 7.1 + 9.3 = 31.8$
There are 6 numbers.
$31.8 \div 6 = 5.3$
mean: 5.3

c. 3, 3, 4.3, 5.1, 7.1, 9.3
$4.3 + 5.1 = 9.4$
There are 2 numbers.
$9.4 \div 2 = 4.7$
median: 4.7

d. 3, 3, 4.3, 5.1, 7.1, 9.3
mode: 3

e. 3, 3, 4.3, 5.1, 7.1, 9.3
$9.3 - 3 = 6.3$
range: 6.3

Mean, Median, Mode & Range Additional Practice

1. a. 3.1, 4.5, 7.2, 8, 8, 9.4

b. $3.1 + 4.5 + 7.2 + 8 + 8 + 9.4 = 40.2$
There are 6 numbers.
$40.2 \div 6 = 6.7$
mean: 6.7

c. 3.1, 4.5, 7.2, 8, 8, 9.4
$7.2 + 8 = 15.2$
There are 2 numbers.
$15.2 \div 2 = 7.6$
median: 7.6

d. 3.1, 4.5, 7.2, 8, 8, 9.4
mode: 8

e. 3.1, 4.5, 7.2, 8, 8, 9.4
$9.4 - 3.1 = 6.3$
range: 6.3

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Order Fractions & Decimal Numbers

1. a. $\frac{3}{8}$: Half of 8 is 4. 3 is less than 4, so $\frac{3}{8} < \frac{1}{2}$.

$\frac{7}{10}$: Half of 10 is 5. 7 is greater than 5, so $\frac{7}{10} > \frac{1}{2}$.

$\frac{7}{6}$: 7 is greater than 6, so $\frac{7}{6} > 1$.

Least to greatest: $\frac{3}{8}, \frac{1}{2}, \frac{7}{10}, \frac{7}{6}$

b. 8.4333, 8.4300, 8.4351, 8.0500, 8.4500

middle, 2nd smallest, 2nd greatest, least, greatest

Least to greatest:
8.05, 8.43, 8.4333, 8.4351, 8.45

Order Fractions & Decimal Numbers Additional Practice

1. a. $\frac{8}{7}$: 8 is greater than 7, so $\frac{8}{7} > 1$.

$\frac{4}{9}$: Half of 9 is 4.5. 4 is less than 4.5, so $\frac{4}{9} < \frac{1}{2}$.

$\frac{7}{12}$: Half of 12 is 6. 7 is greater than 6, so $\frac{7}{12} > \frac{1}{2}$.

Least to greatest: $\frac{4}{9}, \frac{1}{2}, \frac{7}{12}, \frac{8}{7}$

b. 5.0783, 5.0780, 5.0800, 5.0831, 5.0782

middle, least, 2nd greatest, greatest, 2nd smallest

Least to greatest:
5.078, 5.0782, 5.0783, 5.08, 5.0831

Rounding & Place Value

1. billions place:
4,892,583,109.7925
round up
5,000,000,000

hundredths place:
4,892,583,109.7925
round down
4,892,583,109.79

2. a. Half of 10 is 5. 3 is less than 5.

$\frac{3}{10}$ is less than $\frac{1}{2}$ ⟶ round down

$\frac{3}{10}$ ⟶ 0

b. $\frac{1}{2}$ ⟶ round up

$12\frac{1}{2}$ ⟶ 13

c. $\frac{48}{7} = 6\frac{6}{7}$

Half of 7 is $3\frac{1}{2}$. 6 is greater than $3\frac{1}{2}$.

$\frac{6}{7}$ is greater than $\frac{1}{2}$ ⟶ round up

$6\frac{6}{7}$ ⟶ 7

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Rounding & Place Value Additional Practice

1. millions place:
9,624,702,544.5614
round up
9,625,000,000

thousandths place:
9,624,702,544.5614
round down
9,624,702,544.561

2. a. Half of 9 is $4\frac{1}{2}$. 5 is greater than $4\frac{1}{2}$.
$\frac{5}{9}$ is greater than $\frac{1}{2}$ → round up
$\frac{5}{9}$ → 1

b. Half of 11 is $5\frac{1}{2}$. 4 is less than $5\frac{1}{2}$.
$\frac{4}{11}$ is less than $\frac{1}{2}$ → round down
$15\frac{4}{11}$ → 15

c. $\frac{67}{8} = 8\frac{3}{8}$
Half of 8 is 4. 3 is less than 4.
$\frac{3}{8}$ is less than $\frac{1}{2}$ → round down
$8\frac{3}{8}$ → 8

Converting Units of Length, Weight & Capacity

1. a. 12 in = 1 ft
3 × 12 = 36
36 in = 3 ft

b. 10 mm = 1 cm
500 × 10 = 5,000
5,000 mm = 500 cm

c. $8{,}000 \div 10^3 = 8$
8,000 g = 8 kg

d. 1 lb = 16 oz
3 × 16 = 48
3 lb = 48 oz

e. $7.23 \times 10^3 = 7{,}230$
7.23 L = 7,230 mL

f. 4 qt = 1 gal
12 ÷ 4 = 3
12 qt = 3 gal

Converting Units of Length, Weight & Capacity Additional Practice

1. a. 3 ft = 1 yd
6 ÷ 3 = 2
6 ft = 2 yd

b. 100 cm = 1 m
900 ÷ 100 = 9
900 cm = 9 m

c. $7 \times 10^3 = 7{,}000$
7 kg = 7,000 g

d. 16 oz = 1 lb
32 ÷ 16 = 2
32 oz = 2 lb

e. $89{,}042 \div 10^3 = 89.042$
89,042 mL = 89.042 L

f. 1 qt = 4 c
2 × 4 = 8
2 qt = 8 c

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Probability

1. a. $\frac{1}{6}$

   b. $\frac{3}{6} = \frac{1}{2}$

   c. $\frac{2}{6} = \frac{1}{3}$

Probability Additional Practice

1. a. $\frac{2}{6} = \frac{1}{3}$

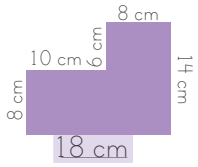
   b. $\frac{3}{6} = \frac{1}{2}$

   c. $\frac{4}{6} = \frac{2}{3}$

Congruency, Angle Measure, Perimeter, Area, Surface Area & Volume

1. a. Perimeter

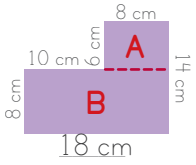
length of missing side: 10 cm + 8 cm = 18 cm



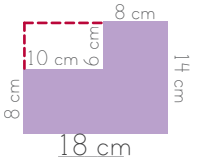
perimeter =
8 cm + 10 cm + 6 cm + 8 cm + 14 cm + 18 cm =
64 cm

Area

Work may vary. The area is shown using two different methods below.



Area A: 8 cm × 6 cm = 48 cm^2
Area B: 18 cm × 8 cm = 144 cm^2
Area of irregular shape:
48 cm^2 + 144 cm^2 = 192 cm^2



Area of larger rectangle: 18 cm × 14 cm = 252 cm^2
Area of the empty space: 10 cm × 6 cm = 60 cm^2
Area of the irregular shape:
252 cm^2 − 60 cm^2 = 192 cm^2

area = 192 cm^2

b. perimeter = 10 in + 10 in + 16 in = 36 in

area = $\frac{16 \text{ in} \times 6 \text{ in}}{2} = \frac{96 \text{ in}^2}{2}$ = 48 in^2

∠A = 53°

2. a. area of top square: 6 ft × 6 ft = 36 ft^2
area of bottom square: 6 ft × 6 ft = 36 ft^2
area of front rectangle: 6 ft × 9 ft = 54 ft^2
area of back rectangle: 6 ft × 9 ft = 54 ft^2
area of left rectangle: 6 ft × 9 ft = 54 ft^2
area of right rectangle: 6 ft × 9 ft = 54 ft^2

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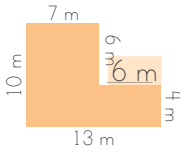
surface area =
$36\ ft^2 + 36\ ft^2 + 54\ ft^2 + 54\ ft^2 + 54\ ft^2 + 54\ ft^2 =$
$288\ ft^2$

b. $V = \ell wh$
$V = 6\ ft \times 6\ ft \times 9\ ft$
$V = 36\ ft^2 \times 9\ ft$
$V = 324\ ft^3$

volume = $324\ ft^3$

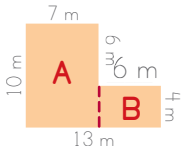
Congruency, Angle Measure, Perimeter, Area, Surface Area & Volume Additional Practice

1. a. Perimeter
length of missing side: $13\ m - 7\ m = 6\ m$

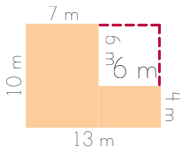


perimeter =
$7\ m + 6\ m + 6\ m + 4\ m + 13\ m + 10\ m =$ $46\ m$

Area
Work may vary. The area is shown using two different methods below.



Area A: $10\ m \times 7\ m = 70\ m^2$
Area B: $6\ m \times 4\ m = 24\ m^2$
Area of irregular shape: $70\ m^2 + 24\ m^2 = 94\ m^2$



Area of larger rectangle: $13\ m \times 10\ m = 130\ m^2$
Area of the empty space: $6\ m \times 6\ m = 36\ m^2$
Area of the irregular shape:
$130\ m^2 - 36\ m^2 = 94\ m^2$

area = $94\ m^2$

b. perimeter = $12\ yd + 20\ yd + 16\ yd =$ $48\ yd$

area = $\frac{16\ yd \times 12\ yd}{2} = \frac{192\ yd^2}{2} =$ $96\ yd^2$

$\angle B =$ $37°$

2. a. area of top square: $8\ m \times 8\ m = 64\ m^2$
area of bottom square: $8\ m \times 8\ m = 64\ m^2$
area of front square: $8\ m \times 8\ m = 64\ m^2$
area of back square: $8\ m \times 8\ m = 64\ m^2$
area of left square: $8\ m \times 8\ m = 64\ m^2$
area of right square: $8\ m \times 8\ m = 64\ m^2$

surface area =
$64\ m^2 + 64\ m^2 + 64\ m^2 + 64\ m^2 + 64\ m^2 + 64\ m^2$
$=$ $384\ m^2$

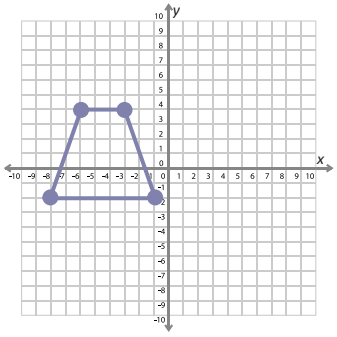
b. $V = \ell wh$
$V = 8\ m \times 8\ m \times 8\ m$
$V = 64\ m^2 \times 8\ m$
$V = 512\ m^3$

volume = $512\ m^3$

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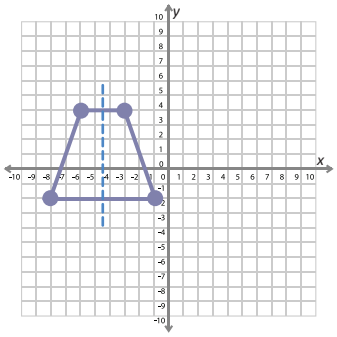
Graphing Ordered Pairs, Geometric Figures & Transformations

1. a.

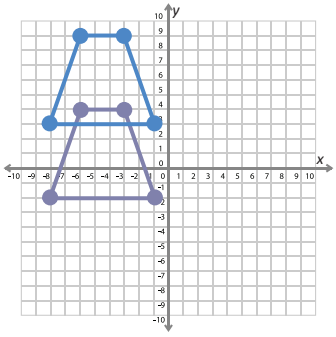


b. trapezoid

c.



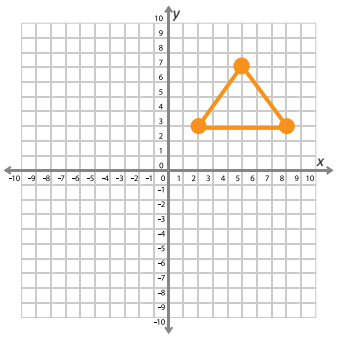
d.



(−6, 9), (−3,9), (−1,3), (−8,3)

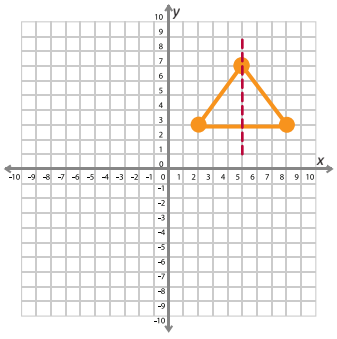
Graphing Ordered Pairs, Geometric Figures & Transformations Additional Practice

1. a.

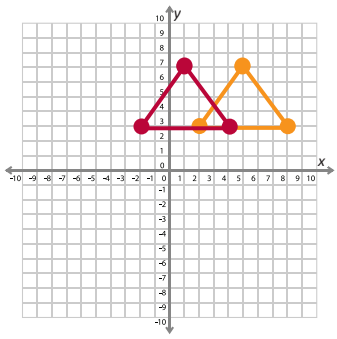


b. triangle

c.



d.



(-2,3), (1,7), (4,3)

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Distributive Property

1. Work may vary. An example is given.

$63 \times 12 = (60 + 3) \times 12 = (12 \times 60) + (12 \times 3) = 720 + 36 = 756$

Distributive Property Additional Practice

1. Work may vary. An example is given.

$4 \times 72 = 4 \times (70 + 2) = (4 \times 70) + (4 \times 2) = 280 + 8 = 288$

Adding, Subtracting, Multiplying & Dividing Fractions

1. a. $\frac{3}{5} + \frac{1}{3} + \frac{1}{6} = \frac{18}{30} + \frac{10}{30} + \frac{5}{30} = \frac{33}{30} = 1\frac{3}{30} = 1\frac{1}{10}$

b. $7\frac{4}{9} - 4\frac{1}{5} = 7\frac{20}{45} - 4\frac{9}{45} = 3\frac{11}{45}$

c. $\frac{12}{25} \div \frac{4}{5} = \frac{12}{25} \times \frac{5}{4} = \frac{\overset{3}{\cancel{12}}}{\underset{5}{\cancel{25}}} \times \frac{\overset{1}{\cancel{5}}}{\underset{1}{\cancel{4}}} = \frac{3}{5}$

d. $\frac{7}{15} \times \frac{20}{21} \times \frac{3}{4} = \frac{\overset{1}{\cancel{7}}}{\underset{3}{\cancel{15}}} \times \frac{\overset{1}{\cancel{20}}}{\underset{1}{\cancel{21}}} \times \frac{\overset{1}{\cancel{3}}}{\underset{1}{\cancel{4}}} = \frac{1}{3}$

Adding, Subtracting, Multiplying & Dividing Fractions Additional Practice

1. a. $\frac{2}{3} + \frac{5}{6} + \frac{3}{4} = \frac{8}{12} + \frac{10}{12} + \frac{9}{12} = \frac{27}{12} = 2\frac{3}{12} = 2\frac{1}{4}$

b. $10\frac{4}{5} - 3\frac{1}{2} = 10\frac{8}{10} - 3\frac{5}{10} = 7\frac{3}{10}$

c. $\frac{8}{15} \div \frac{4}{5} = \frac{8}{15} \times \frac{5}{4} = \frac{\overset{2}{\cancel{8}}}{\underset{3}{\cancel{15}}} \times \frac{\overset{1}{\cancel{5}}}{\underset{1}{\cancel{4}}} = \frac{2}{3}$

d. $\frac{5}{7} \times \frac{9}{10} \times \frac{7}{18} = \frac{\overset{1}{\cancel{5}}}{\underset{1}{\cancel{7}}} \times \frac{\overset{1}{\cancel{9}}}{\underset{2}{\cancel{10}}} \times \frac{\overset{1}{\cancel{7}}}{\underset{2}{\cancel{18}}} = \frac{1}{4}$

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Circle: Radius, Diameter, Circumference & Area

1. a. name the circle: $\odot B$

   b. name two radii: $\overline{AB}$ (or $\overline{BA}$) and $\overline{CB}$ (or $\overline{BC}$)

   c. radius = 20 in ÷ 2 = 10 in

   d. diameter = 20 in

   e. $C = \pi d$
   $C \approx 3.14 \times 20$ in
   $C \approx 62.8$ in
   circumference ≈ 62.8 in

   f. $A = \pi r^2$
   $A \approx 3.14 \times (10 \text{ in})^2$
   $A \approx 3.14 \times (10 \text{ in} \times 10 \text{ in})$
   $A \approx 3.14 \times 100 \text{ in}^2$
   $A \approx 314 \text{ in}^2$

Circle: Radius, Diameter, Circumference & Area Additional Practice

1. a. name the circle: $\odot M$

   b. name two radii: $\overline{LM}$ (or $\overline{ML}$) and $\overline{NM}$ (or $\overline{MN}$)

   c. radius = 5 cm

   d. diameter = 5 cm × 2 = 10 cm

   e. $C = \pi d$
   $C \approx 3.14 \times 10$ cm
   $C \approx 31.4$ cm
   circumference ≈ 31.4 cm

   f. $A = \pi r^2$
   $A \approx 3.14 \times (5 \text{ cm})^2$
   $A \approx 3.14 \times (5 \text{ cm} \times 5 \text{ cm})$
   $A \approx 3.14 \times 25 \text{ cm}^2$
   $A \approx 78.5 \text{ cm}^2$

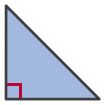
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Triangle & Quadrilateral Classification

1. a. The figure should have two pairs of parallel sides.



b. The triangle should have a right angle and two sides of the same length.



2. a. Orientation may vary.



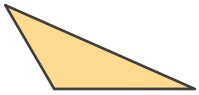
b. 

Triangle & Quadrilateral Classification Additional Practice

1. a. The figure should have two pairs of parallel sides and four sides of the same length.



b. The triangle should have an obtuse angle and three sides of different lengths.



2. a. 

b. Orientation may vary.



Ratios, Proportions & Scales

1. 4 : 3 or $\frac{4}{3}$

2. measured distance: 3 cm

actual distance: $\frac{1 \text{ cm}}{400 \text{ m}} = \frac{3 \text{ cm}}{x}$ (× 3)

x = 1,200 m

Ratios, Proportions & Scales Additional Practice

1. 7 : 4 or $\frac{7}{4}$

2. measured distance: 20 mm

actual distance: $\frac{1 \text{ mm}}{80 \text{ mi}} = \frac{20 \text{ mm}}{x}$ (× 20)

x = 1,600 mi

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Adding, Subtracting, Multiplying & Dividing Decimal Numbers

1. a.
$$\begin{array}{r} {\scriptstyle 7\ 9\ 9} \\ \cancel{8}.\cancel{0}\cancel{0}{\scriptstyle 1}0 \\ -\ 3.1\ 4\ 3 \\ \hline 4.8\ 5\ 7 \end{array}$$

b.
$$\begin{array}{r} {\scriptstyle 1} \\ 6.032 \\ \times\quad 1.4 \\ \hline 24128 \\ +\ 60320 \\ \hline 8.4448 \end{array}$$

2. a.
$$3\overline{)9.03} \quad = \quad 3.01$$

b. $45.92 \div 0.21 \longrightarrow 45.92 \div 0.21 \longrightarrow 4592 \div 21$

$$21\overline{)4592.00} \quad = \quad 218.66\ldots = 218.\overline{6}$$

$$\begin{array}{r} -42 \\ \hline 39 \\ -21 \\ \hline 182 \\ -168 \\ \hline 140 \\ -126 \\ \hline 140 \\ -126 \\ \hline 14 \end{array}$$

Adding, Subtracting, Multiplying & Dividing Decimal Numbers Additional Practice

1. a.
$$\begin{array}{r} {\scriptstyle 8\ 9\ 9} \\ \cancel{9}.\cancel{0}\cancel{0}0 \\ -\ 5.2\ 7\ 4 \\ \hline 3.7\ 2\ 6 \end{array}$$

b.
$$\begin{array}{r} {\scriptstyle 1} \\ 5.301 \\ \times\quad 4.2 \\ \hline 10602 \\ +212040 \\ \hline 22.2642 \end{array}$$

2. a.
$$4\overline{)12.08} \quad = \quad 3.02$$

b. $3.5 \div 0.06 \longrightarrow 3.50 \div 0.06 \longrightarrow 350 \div 6$

$$6\overline{)350.00} \quad = \quad 58.33\ldots = 58.\overline{3}$$

$$\begin{array}{r} -30 \\ \hline 50 \\ -48 \\ \hline 20 \\ -18 \\ \hline 20 \\ -18 \\ \hline 2 \end{array}$$

Percent of a Number

1. a. $64 \div 4 = 16$

25% of 64 = 16

b. 1.2×45

$$\begin{array}{r} {\scriptstyle 1} \\ 45 \\ \times\ 1.2 \\ \hline 90 \\ +450 \\ \hline 54.0 \end{array}$$

120% of 45 = 54

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Percent of a Number Additional Practice

1. a. $30 \div 10 = 3$
10% of 30 = 3

b. 0.22×92

$$\begin{array}{r} {\scriptstyle 1} \\ 0.22 \\ \times \quad 92 \\ \hline 44 \\ +1980 \\ \hline 20.24 \end{array}$$

22% of 92 = 20.24

Problem Solving

1. 12 in: 1 ft
48 in ÷ 12 = 4 ft
length = 4 ft

width = $\frac{1}{2} \times 4$ ft = 2 ft

height = 1 ft

$V = \ell wh$
$V = 4 \text{ ft} \times 2 \text{ ft} \times 1 \text{ ft}$
$V = 8 \text{ ft}^2 \times 1 \text{ ft}$
$V = 8 \text{ ft}^3$

Problem Solving Additional Practice

1. total marbles:
84 marbles + 12 marbles = 96 marbles

marbles shared with his sister:
96 marbles ÷ 2 = 48 marbles

marbles left after sharing with his sister:
96 marbles − 48 marbles = 48 marbles

marbles shared with his cousin: 8 marbles

marbles left: 48 marbles − 8 marbles = 40 marbles

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Number Patterns & Negative Numbers

1. a. $-15, -12, -9, -6$
   $+3 \quad +3 \quad +3$

   rule: +3

   $-6 + 3 = -3$
   $-3 + 3 = 0$
   $0 + 3 = 3$

   $-3, 0, 3$

   b. $80, 40, 20, 10$
   $\div 2 \quad \div 2 \quad \div 2$

   rule: ÷2

   $10 \div 2 = 5$
   $5 \div 2 = 2.5$ or $2\frac{1}{2}$
   $2.5 \div 2 = 1.25$ or $1\frac{1}{4}$

   $5, 2.5, 1.25$ or $5, 2\frac{1}{2}, 1\frac{1}{4}$

   c. $4, 8, 11, 22, 25$
   $\times 2 \quad +3 \quad \times 2 \quad +3$

   rule: ×2 then +3

   $25 \times 2 = 50$
   $50 + 3 = 53$
   $53 \times 2 = 106$

   $50, 53, 106$

Number Patterns & Negative Numbers Additional Practice

1. a. $10, 9.6, 9.2, 8.8$
   $-0.4 \quad -0.4 \quad -0.4$

   rule: −0.4

   $8.8 - 0.4 = 8.4$
   $8.4 - 0.4 = 8$
   $8 - 0.4 = 7.6$

   $8.4, 8, 7.6$

   b. $\frac{1}{4}, \frac{1}{2}, 1, 2$
   $\times 2 \times 2 \times 2$

   rule: ×2

   $2 \times 2 = 4$
   $4 \times 2 = 8$
   $8 \times 2 = 16$

   $4, 8, 16$

   c. $40, 50, 25, 35, 17.5$
   $+10 \quad \div 2 \quad +10 \quad \div 2$

   rule: +10 then ÷2

   $17.5 + 10 = 27.5$
   $27.5 \div 2 = 13.75$
   $13.75 + 10 = 23.75$

   $27.5, 13.75, 23.75$

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Converting Fractions, Decimals & Percents

1. Work for each problem is shown at the right.

	Fraction	Decimal	Percent
A	$\frac{3}{8}$	0.375	37.5%
B	$\frac{11}{20}$	0.55	55%
C	$\frac{21}{25}$	0.84	84%

A $8\overline{)3.0^{6}0^{4}0}$ $= 0.375$

$0.375 \longrightarrow 0.375\% \longrightarrow 37.5\%$

B $0.55 = \frac{55}{100} = \frac{11}{20}$ (÷ 5)

$0.55 \longrightarrow 0.55\% \longrightarrow 55\%$

C $84\% \longrightarrow 84\% \longrightarrow 0.84$

$0.84 = \frac{84}{100} = \frac{21}{25}$ (÷ 4)

Converting Fractions, Decimals & Percents Additional Practice

1. Work for each problem is shown below.

	Fraction	Decimal	Percent
A	$\frac{7}{8}$	0.875	87.5%
B	$\frac{18}{25}$	0.72	72%
C	$\frac{19}{20}$	0.95	95%

A $8\overline{)7.0^{6}0^{4}0}$ $= 0.875$

$0.875 \longrightarrow 0.875\% \longrightarrow 87.5\%$

B $0.72 = \frac{72}{100} = \frac{18}{25}$ (÷ 4)

$0.72 \longrightarrow 0.72\% \longrightarrow 72\%$

C $95\% \longrightarrow 95\% \longrightarrow 0.95$

$0.95 = \frac{95}{100} = \frac{19}{20}$ (÷ 5)

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Expressions & Equations

1. a. $s + 31 = 69$
$69 - 31 = s$
$s = 38$

b. $n - 18 = 2$
$2 + 18 = n$
$n = 20$

c. $9t = 54$
$\frac{54}{9} = t$
$t = 6$

d. $\sqrt{x} = 15$
$15^2 = x$
$x = 225$

Expressions & Equations Additional Practice

1. a. $36 \div u = 4$
$4 \times u = 36$
$36 \div 4 = u$
$u = 9$

b. $k + 82 = 104$
$104 - 82 = k$
$k = 22$

c. $65 - c = 14$
$14 + c = 65$
$65 - 14 = c$
$c = 51$

d. $p^2 = 144$
$\sqrt{144} = p$
$p = 12$

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