6/7 to 7/8
Summer Workbook
Answer Keys
Patterns

Carefully study the patterns of numbers below. Complete each pattern.

1. \( \frac{10}{10}, \frac{100}{10}, \frac{1,000}{10}, \frac{10,000}{10}, \frac{100,000}{10}, \frac{1,000,000}{10}, \frac{10,000,000}{10} \).

2. 17, 15, 25, 23, 33, 31, 41, 39, 49, 47.

3. 800, 80, 8, 0.8, 0.08, 0.008, 0.0008, 0.00008.

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

5. 1, 6, 5, 10, 9, 14, 13, 18, 17, 22, 21.

6. \( \frac{1}{2}, \frac{2}{3}, \frac{3}{4}, \frac{4}{5}, \frac{5}{6}, \frac{6}{7} \), \( \frac{7}{8}, \frac{8}{9}, \frac{9}{10}, \frac{10}{11} \).

7. 7, 21, 63, 189, 567, 1,701, 5,103, 15,309.

8. 125, 120, 115, 110, 105, 100, 95, 90.

9. 3, 6, 7, 14, 15, 30, 31, 62, 63, 126, 127.

10. 2, 20, 4, 40, 8, 80, 16, 160, 32, 320, 64.

Challenge! The following is a special pattern called the Fibonacci sequence. See if you can discover and complete this interesting pattern.

1. 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 144.
On What Should You Watch Monster Movies?

1 Rex Prep is comparing prices of carpets for his room. Find the price per square yard for each carpet. Then complete the vertical bar graph.

- **S.** Carpet #1 is 2 yd by 3 yd and costs $54.
  - $2 \times 3 = 6 \text{ yd}^2 \quad \frac{54}{6} = 9 \text{ per sq yd}$

- **A.** Carpet #2 is 2.5 yd by 4 yd and costs $65.
  - $65 = $26.00 \text{ per sq yd}$

- **I.** Carpet #3 is 3.5 yd by 3 yd and costs $120.
  - $120 = $40.00 \text{ per sq yd}$

- **R.** Carpet #4 is 2.5 yd by 3.5 yd and costs $75.
  - $75 = $21.43 \text{ per sq yd}$

2 Given below are the dimensions and monthly rent for four offices. Find the monthly rent per square foot for each office. Then complete the horizontal bar graph.

- **A.** Office A 30 ft by 22 ft; $15,180 monthly. $50/sq ft
- **B.** Office B 27 ft by 10 ft; $9333 monthly. $317/sq ft
- **C.** Office A 25 ft by 28 ft; $8750 monthly. $318/sq ft
- **D.** Office D 20 ft by 10 ft; $25,760 monthly. $181/sq ft

3 Mr. Watchalot is comparing prices of TV sets. For each TV, find the cost per square inch of screen. Then complete the vertical bar graph.

- **B.** TV #1: Screen is 6 in. by 8 in; cost is $199.
  - $4.15/in^2

- **M.** TV #2: Screen is 15 in. by 20 in; cost is $725.
  - $2.42/in^2

- **V.** TV #3: Screen is 21 in. by 28 in; cost is $1690.
  - $2.38/in^2

- **C.** TV #4: Screen is 27 in. by 36 in; cost is $3159.
  - $2.35/in^2

| $A | $B | $C | $D | $E | $F | $G | $H | $I | $J | $K | $L | $M | $N | $O | $P | $Q | $R | $S | $T | $U | $V |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| $23 | $9.18 | $4.15 | $11.43 | $14 | $3.31 | $9.00 | $3.25 | $8.57 | $28 | $6.50 | $2.42 | $26 | $17 | $2.87 |

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CREATURE COORDINATES

Bugs are a fact of life on a camping trip. Lightning bugs, beetles, spiders, mosquitoes, and other critters keep the campers company.

Find the location of the creatures on the coordinate grid. Write an ordered pair of numbers to show the location (coordinates) for each bug.

Write an ordered pair for each.
1. A \((-6, 6)\)
2. B \((5, 4)\)
3. C \((3, -2)\)
4. D \((2, 5)\)
5. E \((-7, 3)\)
6. F \((-4, -6)\)
7. G \((-3, -3)\)

Write the letter.
8. What creature is at \((6, 7)\)?
9. What creature is at \((-4, 0)\)?
10. What creature is at \((5, -4)\) and \((6, -4)\)?
11. What creature is at \((-5, -6)\)?
12. What creature is at \((0, 1)\)?

Draw a creature at each of these locations:
13. a spider at \((5, 0)\)
14. a fly at \((-8, -8)\)
15. a dragonfly at \((0, -6)\)
16. a mosquito at \((-7, -2)\)
17. a spider at \((-2, 6)\)
18. a worm at \((4, -7)\)
19. a fly at \((-6, -2)\)
20. a bee at \((-1, -2)\)
How Can You Make VARNISH Disappear?
Complete each table and graph. Write the letter of each question in the box containing its answer.

1. Use the grid to draw the next two figures in the pattern above. Complete the T-chart and graph to show the relationship between figure number (n) and perimeter (P).

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<tr>
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   **CHALLENGE:** Can you write an equation to show the relationship between P and n? 

   \[ P = 2n + 8 \]

2. One fine day, Suzi Savealot had $80 in the bank. Then every day after that she added $20 to her savings. On the same fine day, Sara Spendalot had $320 in the bank, but every day after that she took $40 from her savings to spend.

   T. On which day did Sara’s savings reach zero? **8**
   O. On which day did the two girls have the same amount? **4**
   E. How much did they have then? **$160**

3. The graph shows a 60-mile bike race between Ben (solid line) and Jerry (dashed line).

   A. What was Jerry’s average speed (distance divided by time)? **12 mph**
   T. What was Ben’s average speed for the first 2 hours? **10 mph**
   K. What was Ben’s average speed for the second 2 hours? **30 mph**
   R. What was Ben’s overall average speed (total distance divided by total time)? **15 mph**
   U. Who won the race? **Ben**
Slopes and Intercepts

Find the slope and intercepts for each line.

1. slope $\frac{2}{3}$
2. x-intercept $(-2, 0)$
3. y-intercept $(0, 2)$
4. slope $-\frac{4}{3}$
5. x-intercept $(-3, 0)$
6. y-intercept $(0, -4)$
7. slope $\frac{3}{4}$
8. x-intercept $(4, 0)$
9. y-intercept $(0, -3)$

Answer the questions for each graph. Be sure to include a unit of measurement with each answer.

10. How much money had been saved at time 0? $300$

11. What was the rate of saving ($\$/mo)? $8.25/\text{mo}$

12. What was the distance from home at time 0? $175 \text{ mi}$

13. What was the rate of speed (mph)? $44 \text{ mph}$

14. What was the height of the tree at time 0? $14 \text{ ft}$

15. What was the rate of growth (ft/yr)? $0.5 \text{ ft/yr}$

16. What was the temperature at sea level? At 20,000 ft? $40^\circ \text{F}, -30^\circ \text{F}$

17. At what rate did the temperature change ($^\circ \text{F}/1000 \text{ ft}$)? $-3^\circ \text{F}/1000 \text{ ft}$

18. At about what elevation was the temperature $0^\circ \text{F}$? About 13,000 ft

19. What would the temperature be outside a jet flying at 40,000 ft? $-80^\circ \text{F}$

20. What was the rate of speed from 0 to 3 h? $50 \text{ mph}$

21. What was the rate of speed from 3 to 4 h? $60 \text{ mph}$

22. What was the rate of speed from 4 to 9 h? $60 \text{ mph}$

23. What was the overall average rate of speed (total distance divided by total time)? $50 \text{ mph}$
What Do You Call It When 50 People Stand on a Wooden Dock?

Cross out the letters above each correct answer. When you finish, write the remaining letters in the spaces at the bottom of the page.

In Exercises 1-4, fill in the blank.

1. If the sum of the measures of two angles is 180°, the angles are **supplementary**.

2. If the sum of the measures of two angles is 90°, the angles are **complementary**.

3. When two angles in a plane share a vertex and a side but no common interior points, they are called **adjacent** angles. Example: ∠AOB and ∠AOD.

4. When two lines intersect, they form two pairs of “opposite” angles called **vertical** angles. Example: ∠AOB and ∠COD.

In Exercises 5-14, use the given angle measures to find the required ones.

5. m∠EGH 45°

6. m∠XWY 61°

7. m∠DAC 33°

8. m∠MON 108°

9. m∠STR 98°

10. m∠PTS 82°

11. m∠JNK 52°

12. m∠MNL 142°

13. m∠YOU 36°

14. m∠UOV 64°

In Exercises 15-18, use an algebraic equation to find the measure of the angle labeled x.

15.

16.

17.

18.

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<td>57°</td>
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<td>50°</td>
<td>33°</td>
<td>48°</td>
<td>36°</td>
<td>complementary</td>
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PRESSURE
Area of Circles

\[ \pi = 3.14 \]
\[ r = \text{radius} \]
\[ d = \text{diameter} = (2r) \]

**Example 1**

Area = \( \pi r^2 \)

\[ A = \pi (7)^2 \]
\[ A = 153.86 \text{ cm}^2 \]

**Example 2**

\[ A = \pi r^2 \]
\[ d = 18 \text{ mm} \]
Radius is half of diameter.
To find the radius, divide by 2.

\[ r = 18 \div 2 = 9 \]
\[ A = (3.14)(9)^2 \]
\[ A = 254.34 \text{ mm}^2 \]

Find the areas.

1. \[ 9 \text{ yd} \]
   \[ 63.59 \text{ yd}^2 \]

2. \[ 6 \text{ in.} \]
   \[ 113.04 \text{ in}^2 \]

3. \[ 8 \text{ km} \]
   \[ 50.24 \text{ km}^2 \]

4. \[ 5 \text{ m} \]
   \[ 78.5 \text{ m}^2 \]

5. \[ 8 \text{ cm} \]
   \[ 28.26 \text{ cm}^2 \]

6. \[ 11 \text{ ft} \]
   \[ 379.94 \text{ ft}^2 \]
What Happened When the TV Set Asked the Remote Control for a Date?

Find each answer in the answer column. Write the letter of the answer in the circle that contains the exercise number. Most answers are rounded. Use 3.14 for π.

Use the diameter (d) or radius (r) to find the area.

1. \(3 \text{ in.} \quad 28.3 \text{ in}^2\)
2. \(5.2 \text{ m} \quad 84.9 \text{ m}^2\)
3. \(80 \text{ cm} \quad 5024 \text{ cm}^2\)
4. \(18.8 \text{ mi} \quad 277.5 \text{ mi}^2\)

5. \(r = 12 \text{ in.} \quad 452.2 \text{ in}^2\)
6. \(r = 0.66 \text{ mi} \quad 1.37 \text{ mi}^2\)
7. \(d = 7.5 \text{ m} \quad 44.9 \text{ m}^2\)
8. \(d = 2 \text{ cm} \quad 3.14 \text{ cm}^2\)

Solve.

9. Radio station KLUV broadcasts in all directions to a distance of 60 mi. What is the area over which the station can be heard? \(11,304 \text{ mi}^2\)

10. How many squares are inside the circle below? 78.5

11. A fugitive has escaped in a train wreck. The police believe he could not have traveled more than 7 mi in any direction from the wreck. How many square miles must be searched? 153.9 \text{ mi}^2

12. A manhole cover has a diameter of 3 ft. It weighs 8.2 lb per square foot. How much does the manhole cover weigh? 57.9 lb

13. A 12-inch diameter pizza is cut into 8 equal pieces. What is the area of each piece? 14.1 \text{ in}^2

Find the area of the shaded region.

14. \(301.4 \text{ ft}^2\)
15. \(113.5 \text{ cm}^2\)
16. \(27.5 \text{ in}^2\)

Answers 1-16

- L 269.4 \text{ mi}^2
- O 5024 \text{ cm}^2
- S 44.2 \text{ m}^2
- D 28.3 \text{ in}^2
- F 1.54 \text{ mi}^2
- M 452.2 \text{ in}^2
- T 5196 \text{ cm}^2
- E 84.9 \text{ m}^2
- H 3.14 \text{ cm}^2
- A 48.3 \text{ m}^2
- U 1.37 \text{ mi}^2
- Y 438.3 \text{ in}^2
- N 277.5 \text{ mi}^2

Answers 9-16

- S 124.3 \text{ cm}^2
- H 153.9 \text{ mi}^2
- A 62.4 \text{ lb}
- T 301.4 \text{ ft}^2
- F 18.9 \text{ in}^2
- E 78.5
- I 57.9 \text{ lb}
- D 113.5 \text{ cm}^2
- L 82.4
- W 11,304 \text{ mi}^2
- R 27.5 \text{ in}^2
- B 326.4 \text{ ft}^2
- N 14.1 \text{ in}^2
- O 9285 \text{ mi}^2
Adding and Subtracting Mixed Numbers

\[ 3 \frac{1}{2} + 1 \frac{3}{8} = 3 \frac{4}{8} + 1 \frac{3}{8} = 4 \frac{7}{8} \]

Solve each problem. Write the answer in simplest form.

1. \[ 4 \frac{5}{7} - 2 \frac{2}{3} = \]
2. \[ 9 \frac{3}{5} + 4 \frac{2}{3} = 14 \frac{4}{15} \]
3. \[ 7 \frac{1}{2} - 2 \frac{7}{10} = 4 \frac{4}{5} \]

4. \[ 17 \frac{3}{4} - 8 \frac{2}{5} = 9 \frac{7}{20} \]
5. \[ 16 \frac{1}{4} - 7 \frac{5}{8} = 8 \frac{5}{8} \]
6. \[ 6 \frac{2}{7} - 1 \frac{1}{3} = 4 \frac{20}{21} \]

7. \[ 3 \frac{7}{12} + 7 \frac{5}{6} = 11 \frac{5}{12} \]
8. \[ 4 \frac{1}{8} - 3 \frac{1}{2} = \frac{5}{8} \]
9. \[ 8 \frac{1}{8} + 5 \frac{3}{4} = 13 \frac{7}{8} \]

10. \[ 12 \frac{7}{9} + 3 \frac{2}{3} = 16 \frac{4}{9} \]
11. \[ 4 \frac{1}{7} - 3 \frac{1}{5} = \frac{33}{35} \]
12. \[ 6 \frac{4}{5} + 2 \frac{3}{9} = 9 \frac{2}{15} \]

13. \[ 1 \frac{9}{12} - 1 \frac{3}{4} = 0 \]
14. \[ 4 \frac{8}{9} + 2 \frac{5}{6} = 7 \frac{13}{18} \]
15. \[ 4 \frac{3}{6} + 7 \frac{3}{8} = 11 \frac{7}{8} \]

16. \[ 5 \frac{1}{2} - 2 \frac{2}{7} = 3 \frac{3}{14} \]
17. \[ 2 \frac{8}{10} - 1 \frac{5}{15} = 1 \frac{7}{15} \]
18. \[ 11 \frac{4}{5} - 3 \frac{5}{6} = 7 \frac{34}{30} \]
Simplify.

1 \(2 \frac{2}{3} - 1 \frac{1}{2}\) \(\frac{1}{6}\)

2 \(-4 \frac{1}{2} + 1 \frac{3}{10}\) \(-3 \frac{1}{5}\)

3 \(-3 \frac{1}{3} - 2 \frac{3}{4}\) \(-6 \frac{1}{2}\)

4 \(3 \frac{5}{8} + (-5 \frac{1}{4})\) \(-1 \frac{5}{8}\)

5 \(5 \frac{1}{2} + \frac{14}{9}\) \(6 \frac{17}{18}\)

6 \(-4 \frac{3}{5} + (-2 \frac{2}{3})\) \(-7 \frac{4}{15}\)

7 \(3 \frac{5}{6} - 7 \frac{1}{2}\) \(-3 \frac{2}{3}\)

8 \(-2 \frac{1}{4} + 3 \frac{4}{5} + 4\) \(5 \frac{11}{20}\)

9 \(6 \frac{1}{2} - (-7 \frac{7}{8})\) \(8 \frac{3}{8}\)

Solve.

10 \(x + 4 \frac{1}{3} = 7 \frac{7}{10}\) \(x = 3 \frac{1}{2}\)

11 \(3 \frac{3}{4} + t = -2 \frac{1}{6}\) \(t = -5 \frac{11}{12}\)

12 \(n - 5 \frac{5}{9} = -8 \frac{1}{3}\) \(n = -3 \frac{2}{3}\)

13 Mr. Glock’s gas tank holds 16 \(\frac{1}{2}\) gal when full. When Mr. Glock drove into a gas station, the tank contained 4 \(\frac{2}{5}\) gal. How much gas was needed to fill the tank? \(12 \frac{1}{10}\) gal.

14 A cabinet has shelves that are 12 \(\frac{1}{2}\) in. apart. On one shelf, Katherine stacked a CD player that is 4 \(\frac{5}{8}\) in. high on top of an amplifier that is 6 \(\frac{3}{4}\) in. high. How much space was left above the CD player? \(1 \frac{1}{8}\) in.

15 A sheet of paper is 8 \(\frac{1}{2}\) in. wide and 11 in. long. The sheet is printed with a margin 1 \(\frac{1}{4}\) in. wide on all four sides. Find the perimeter of the printed part of the page. 29 in.
Multiplying Fractions

Solve each problem. Write the answer in simplest form.

1. $10 \frac{2}{3} \times 7 \frac{1}{8} =$
2. $5 \frac{4}{7} \times 1 \frac{2}{3} = \frac{9 \cdot 3}{7}$
3. $4 \frac{5}{6} \times 5 \frac{1}{7} =$
   $24 \frac{6}{7}$

4. $\frac{3}{5} \times \frac{15}{18} = \frac{1}{2}$
5. $8 \frac{1}{3} \times 6 \frac{3}{5} = 55$
6. $2 \frac{11}{13} \times 4 \frac{2}{3} =$
   $13 \frac{11}{3}$

7. $5 \frac{1}{2} \times \frac{3}{11} = \frac{1}{2}$
8. $3 \frac{1}{5} \times 12 \frac{1}{2} = 40$
9. $5 \frac{2}{3} \times 8 \frac{1}{4} =$
   $46 \frac{3}{4}$

10. $7 \frac{2}{7} \times 2 \frac{1}{3} = 17$
11. $1 \frac{1}{2} \times 3 \frac{1}{5} = 4 \frac{4}{5}$
12. $\frac{2}{3} \times \frac{21}{24} =$
    $\frac{7}{12}$

13. $5 \frac{3}{5} \times 2 \frac{4}{7} = 14 \frac{2}{5}$
14. $7 \frac{2}{3} \times 3 \frac{1}{2} = 26 \frac{5}{2}$
15. $5 \frac{3}{12} \times 2 \frac{1}{7} =$
    $11 \frac{1}{4}$

16. $9 \frac{1}{3} \times 2 \frac{1}{7} = 20$
17. $2 \frac{3}{5} \times 1 \frac{1}{4} = 3 \frac{1}{4}$
18. $2 \frac{4}{7} \times 2 \frac{3}{9} =$
    $6$
Dividing Fractions

Solve each problem. Write the answer in simplest form.

1. \( \frac{6}{3} \div \frac{4}{9} = \)

2. \( \frac{3}{3} \div \frac{1}{5} = \frac{2}{7} \)

3. \( \frac{2}{10} \div \frac{9}{15} = \frac{3}{4} \)

4. \( \frac{4}{2} \div \frac{5}{4} = \frac{1}{7} \)

5. \( \frac{6}{4} \div \frac{2}{2} = \frac{7}{10} \)

6. \( \frac{2}{6} \div \frac{4}{3} = \frac{1}{2} \)

7. \( \frac{5}{5} \div \frac{4}{2} = \frac{1}{15} \)

8. \( \frac{7}{7} \div \frac{2}{14} = \frac{3}{5} \)

9. \( \frac{3}{2} \div \frac{4}{3} = \frac{21}{26} \)

10. \( \frac{2}{3} \div \frac{3}{10} = \frac{40}{51} \)

11. \( \frac{4}{5} \div \frac{3}{5} = \frac{1}{6} \)

12. \( \frac{5}{3} \div \frac{1}{9} = \frac{3}{3} \)

13. \( \frac{4}{8} \div \frac{2}{12} = \frac{2}{10} \)

14. \( \frac{7}{4} \div \frac{1}{4} = \frac{6}{5} \)

15. \( \frac{3}{4} \div \frac{2}{3} = \frac{2}{4} \)

16. \( \frac{3}{5} \div \frac{1}{10} = \frac{2}{5} \)

17. \( \frac{2}{9} \div \frac{4}{6} = \frac{8}{15} \)

18. \( \frac{4}{5} \div \frac{3}{8} = \frac{3}{55} \)
Writing Fractions as Decimals

\[
\begin{align*}
\frac{1}{5} & \rightarrow 5 \div 1.00 \rightarrow \frac{1}{5} = 0.2 \quad \text{Terminating} \\
\frac{1}{3} & \rightarrow 3 \div 1.00 \rightarrow \frac{1}{3} = 0.\overline{3} \quad \text{Repeating}
\end{align*}
\]

Write each fraction as a decimal. Draw a line above repeating numbers in decimals.

1. \(\frac{2}{3} = \overline{0.6}\)
2. \(\frac{1}{2} = 0.5\)
3. \(\frac{4}{33} = 0.\overline{12}\)
4. \(\frac{13}{15} = 0.8\overline{6}\)
5. \(\frac{28}{35} = 0.8\)
6. \(\frac{6}{15} = 0.4\)
7. \(\frac{11}{22} = 0.5\)
8. \(\frac{1}{9} = 0.\overline{1}\)
9. \(\frac{2}{10} = 0.2\)
10. \(\frac{8}{16} = 0.5\)
11. \(\frac{23}{33} = 0.6\overline{9}\)
12. \(\frac{12}{25} = 0.48\)
13. \(3\frac{2}{3} = 3.\overline{6}\)
14. \(\frac{7}{16} = 0.4375\)
15. \(2\frac{3}{5} = 2.6\)
Ratios

2 to 8 → \( \frac{2}{8} = \frac{1}{4} \)
35 : 20 → \( \frac{35}{20} = \frac{7}{4} \)
5 out of 25 → \( \frac{5}{25} = \frac{1}{5} \)

Write each ratio as a fraction. Write the answer in simplest form.

1. 20 to 70 → \( \frac{20 \div 10}{70 \div 10} = \frac{2}{7} \)
3. 121:108 → \( \frac{121}{108} \)
5. 34 out of 82 → \( \frac{17}{41} \)
7. 21 to 45 → \( \frac{7}{15} \)
9. 19 to 84 → \( \frac{19}{84} \)
11. 0.13 out of 1.69 → \( \frac{1}{13} \)
13. 150 to 275 → \( \frac{6}{11} \)
15. 12 out of 133 → \( \frac{12}{133} \)

2. 14 to 43 → \( \frac{14}{43} \)
4. 51:102 → \( \frac{1}{2} \)
6. 112:224 → \( \frac{1}{2} \)
8. 40:231 → \( \frac{40}{231} \)
10. 237 to 32 → \( \frac{237}{32} \)
12. 171 to 132 → \( \frac{57}{44} \)
14. 60 to 116 → \( \frac{15}{29} \)
16. 50:125 → \( \frac{2}{5} \)
Scale Drawings

Use the scale drawings of two different apartments to answer the questions.

1. Which apartment has the greater area?
   Apartment B

2. What is the difference in square feet between Apartment A and Apartment B?
   48 sq ft.

3. How much more closet space is offered by Apartment B than Apartment A?
   56 sq ft.

4. How much more bathroom space is offered by Apartment B than Apartment A?
   6 sq ft.

5. A one-year lease for Apartment A costs $450 per month. A one-year lease for Apartment B costs $525 per month. Which apartment offers the greatest value in terms of the cost per square foot?
   Apartment A
Proportions

\[ \frac{2}{6} = \frac{x}{18} \]

\[ 2 \cdot 18 = 6x \]

\[ \frac{36}{6} = \frac{6x}{6} \]

\[ 6 = x \]

Solve each proportion. Use cross-products.

1. \[ \frac{x}{4} = \frac{8}{12} \]

\[ \frac{8}{4} = \frac{x}{12} \]

\[ 2 = \frac{x}{3} \]

16

2. \[ \frac{20}{30} = \frac{5}{x} \]

\[ 7 \frac{1}{2} \]

3. \[ \frac{18}{24} = \frac{12}{x} \]

\[ 16 \]

4. \[ \frac{80}{x} = \frac{48}{20} \]

\[ 33 \frac{1}{3} \]

5. \[ \frac{5}{5} = \frac{5x}{5} \]

\[ 1 \]

6. \[ \frac{15}{45} = \frac{3}{x} \]

\[ 9 \]

7. \[ \frac{1.4}{x} = \frac{3.6}{2.8} \]

\[ 1.4 \]

8. \[ \frac{8}{5} = \frac{5}{x} \]

\[ 3 \frac{1}{5} \]

9. \[ \frac{8}{6} = \frac{x}{27} \]

\[ 36 \]

10. \[ \frac{144}{6} = \frac{6x}{6} \]

\[ 24 \]

11. \[ \frac{x}{3} = \frac{8}{8} \]

\[ 3 \]

12. \[ \frac{36}{12} = \frac{x}{6} \]

\[ 18 \]

13. \[ \frac{0.14}{0.07} = \frac{x}{1.5} \]

\[ 3 \]

14. \[ \frac{6}{x} = \frac{6}{4} \]

\[ 4 \]

15. \[ \frac{4}{5} = \frac{x}{5} \]

\[ 4 \]

16. \[ \frac{16}{48} = \frac{x}{50} \]

\[ 16 \frac{2}{3} \]
Problem Solving with Proportions

If 3 liters of juice cost $3.75, how much does 9 liters cost?

\[
\frac{\text{liters}}{\text{cost}} = \frac{3}{3.75} = \frac{9}{x}
\]

\[3x = 3.75 \cdot 9\]

\[3x = \frac{33.75}{3}\]

\[x = 11.25\]

9 liters cost $11.25

Solve each problem. Round each answer to the nearest cent.

1. If 3 square feet of fabric cost $3.75, what would 7 square feet cost?  $8.75

\[
\frac{\text{fabric}}{\text{cost}} = \frac{3}{3.75} = \frac{7}{c}
\]

\[3c = 3.75 \cdot 7\]

\[c = \frac{26.25}{3}\]

2. A 12-ounce bottle of soap costs $2.50. How many ounces would be in a bottle that costs $3.75?  18 ounces

3. Four pounds of apples cost $5.00. How much would 10 pounds of apples cost?  $12.50

4. A 12-ounce can of lemonade costs $1.32. How much would a 16-ounce can of lemonade cost?  $1.76

5. J & S Jewelry company bought 800 bracelets for $450.00. How much did each bracelet cost?  $1.78

6. A dozen peaches costs $3.60. How much did each peach cost?  $0.30


8. If a 10-pound turkey costs $20.42, how much would a 21-pound turkey cost?  $42.88
1. This pattern of tiles could be extended to completely cover a surface. Find each ratio:
   
   T. Hexagons to squares. \( \frac{3}{12} \)
   
   E. Triangles to squares. \( \frac{7}{8} \)
   
   O. Squares to triangles. \( \frac{8}{7} \)
   
   I. Hexagons to all tiles. \( \frac{1}{11} \)

2. Write each ratio in simplest form.

   H. \( \frac{8 \text{ in.}}{3 \text{ ft}} = \frac{2}{9} \)
   
   E. \( \frac{2 \text{ min}}{300 \text{ s}} = \frac{2}{5} \)
   
   O. \( \frac{7 \text{ gal}}{10 \text{ qt}} = \frac{14}{5} \)
   
   R. \( \frac{8 \text{ m}}{60 \text{ cm}} = \frac{40}{3} \)
   
   E. \( \frac{500 \text{ g}}{4 \text{ kg}} = \frac{1}{8} \)

3. The Vultures had 15 wins, 9 losses, and 1 tie. Write each ratio in simplest form.

   T. Wins to losses \( \frac{5}{3} \)
   
   O. Wins to ties \( \frac{15}{1} \)
   
   E. Wins to games \( \frac{3}{5} \)
   
   U. Losses to games \( \frac{9}{25} \)

4. The steepness or slope of a ski run can be expressed as a ratio of vertical “rise” to horizontal “run”. Find each slope.

   E. \( \frac{\frac{2}{7}}{} \)
   
   S. \( \frac{\frac{5}{11}}{} \)
   
   T. \( \frac{\frac{3}{4}}{} \)
   
   L. \( \frac{\frac{8}{9}}{} \)

5. Find the perimeter and area for each rectangle at the right. Then write each ratio in simplest form.

   Q. \( \frac{\text{perimeter of a}}{\text{perimeter of b}} = \frac{4}{3} \)
   
   H. \( \frac{\text{area of a}}{\text{area of b}} = \frac{1}{1} \)
   
   N. \( \frac{\text{perimeter of c}}{\text{perimeter of d}} = \frac{12}{13} \)
   
   S. \( \frac{\text{area of a}}{\text{area of c}} = \frac{5}{9} \)

<table>
<thead>
<tr>
<th>15</th>
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<tbody>
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</tbody>
</table>

19
Adding and Subtracting Decimals

\[
\begin{align*}
13.6 + 7.12 &= 20.72 \\
12 - 3.78 &= 8.22
\end{align*}
\]

1. \(3.5 + 8.4 = 11.9\)
2. \(43.57 + 104.6 = 148.17\)
3. \(15.36 + 29.23 + 7.2 = 51.79\)
4. \(2.304 + 6.18 + 9.2 = 17.684\)
5. \($12.91 + $6.99 = $19.90\)
6. \(0.08 + 19 = 19.08\)
7. \(22.63 + 1.694 = 24.324\)
8. \(362.1 + 8.888 + 0.016 = 371.004\)
9. \(1392.16 + 16.16 = 1408.32\)
10. \(83.196 + 0.0017 = 83.1977\)
11. \(17.6 - 9.3 = 8.3\)
12. \(32.3 - 12.72 = 19.58\)
13. \(23.96 - 19.931 = 4.029\)
14. \($29.98 - $16.09 = $13.89\)
15. \(63.36 - 0.007 = 63.353\)
16. \(16.22 - 0.039 = 16.181\)
17. \(44.44 - 16.1 = 28.34\)
18. \($75.02 - $3.99 = $71.03\)
19. \(575.021 - 65.98 = 509.041\)
20. \(394.6 - 27.88 - 0.0933 = 366.6267\)
Multiplying Decimals

The number of decimal places in a product equals the sum of decimal places in the factors.

\[(0.7) (0.04) = 0.028\]
\[1 + 2 = 3\]
place places places

1. \((0.003) (6) = \boxed{0.018}\)
2. \((0.051) (0.03) = \boxed{0.000153}\)
3. \((260) (0.01) = \boxed{2.6}\)
4. \((9.6) (5) = \boxed{48}\)
5. \((7) (3.42) = \boxed{23.94}\)
6. \((5.29) (11.3) = \boxed{59.777}\)
7. \((0.017) (6.2) = \boxed{0.1054}\)
8. \((0.3) (0.03) (0.003) = \boxed{0.000027}\)
9. \((1.5) (0.096) (4.3) = \boxed{0.6192}\)
10. \((0.05) (0.16) (0.001) = \boxed{0.000008}\)
11. \((\bar{8}) (0.217) (0.01) = \boxed{0.01736}\)
12. \((18) (0.08) = \boxed{1.44}\)
13. \((16.01) (0.5) (0.31) = \boxed{2.48155}\)
14. \((1.06) (0.005) = \boxed{0.0053}\)
15. \((4.802) (11.11) = \boxed{53.35022}\)
16. \((10.25) (0.331) = \boxed{3.39275}\)
17. \((5) (1.102) = \boxed{5.51}\)
18. \((12.8) (0.05) (3.09) = \boxed{1.9776}\)
Dividing Decimals

Move the decimal points the number of places needed to make the divisor a whole number.

\[0.03652 ÷ 0.88 = 0.0415\]

\[0.036520\]
\[\underline{352}\]
\[132\]
\[88\]
\[440\]
\[440\]
\[0\]

1. \(0.128 ÷ 0.8 = 0.16\)
2. \(2.45 ÷ 3.5 = 0.7\)
3. \(0.5773 ÷ 5.02 = 0.115\)
4. \(39.78 ÷ 0.195 = 204\)
5. \(4.2016 ÷ 5.2 = 0.808\)
6. \(1.45 ÷ 0.08 = 18.125\)
7. \(0.1716 ÷ 5.2 = 0.033\)
8. \(3.906 ÷ 1.2 = 3.255\)
9. \(6.56 ÷ 0.16 = 41\)
10. \(0.0135 ÷ 4.5 = 0.003\)
11. \(0.0483 ÷ 0.21 = 0.23\)
12. \(0.5418 ÷ 0.3 = 1.806\)
13. \(16.83 ÷ 0.11 = 153\)
14. \(0.1926 ÷ 32.1 = 0.006\)
Mixed Practice with Decimals

1. \(12.16 - 8.72 = 3.44\)
2. \(119.7 + 11.97 = 131.67\)
3. \((3.4) (8) = 27.2\)
4. \(2960 \div 0.37 = 8,000\)
5. \(1.21 \div 1.1 = 1.1\)
6. \(7 + 6.91 = 13.91\)
7. \(18.91 - 11.857 = 7.053\)
8. \((1.35) (21.4) = 28.89\)
9. \(21.2 - 9.03 = 12.17\)
10. \(0.7 + 0.02 + 4 = 4.72\)
11. \((0.25) (2.5) (25) = 15.625\)
12. \(95.6 - 87.81 + 12.21 = 20\)
13. \((0.8) (1.3) (0.62) = 0.6448\)
14. \(37.92 \div 1.2 = 31.6\)
15. \(0.1007 - 5.3 = 0.019\)
16. \(329.82 + 6.129 = 335.949\)
17. \(893.631 - 11.09 = 882.541\)
18. \(18.332 + 82.82 = 101.152\)
19. \(132.03 \div 8.1 = 16.3\)
20. \((16.1) (3.66) = 58.926\)
21. \(1093.62 - 10.993 = 1082.627\)
22. \(6.963 - 2.11 = 4.85\)
What Did the Detectives Say to the Crook?

Solve each problem and find your solution in the answer column. Note the two letters next to it. Write these letters in the two boxes above the exercise number at the bottom of the page.

1. To make his special salad dressing, Wolfgang combines 7 fl oz of oil with 4 fl oz of vinegar. One day he needed a larger amount, so he used 8 fl oz of oil. How much vinegar did he need? 14.6 fl oz

2. The ratio of height to width for a TV screen is 9 to 16. How high is a screen that is 30 in. wide? 16.9 in.

3. GEAR RATIO. The ratio of the number of teeth on Gear A to the number of teeth on Gear B is 5 to 12. How many teeth are on Gear B? 36
   (Hint: Count the teeth on Gear A.)

4. Jessica checked her gas mileage and found that she had used 17.4 gal of gas to travel 392 mi. At this rate, how many gallons will she use to travel from Los Angeles to Miami, a distance of 2,735 mi? 121.4 gal

5. If there are 95 g of fat in 16 oz of ground beef, how much fat is in 3 oz of ground beef? 17.5 g

6. A locomotive is 56 ft long and 11 ft wide. A special effects designer makes a model that is 18 in. long. How wide should it be? 3.5 in.

7. The Screaming Equals' team color is made by mixing red paint with blue paint in a ratio of 12 to 7. How much blue paint should be mixed with 4 gal of red? 2.3 gal

8. A marathon runner ran the first 3 mi in 17.2 min. If she continues running at this pace, how long will it take her to run the entire marathon of 26.2 mi? 150.2 min

9. SOLAR SYSTEM MODEL. The sun has a diameter of 870,000 mi. The Earth has a diameter of 8,000 mi. If a 24-cm-diameter basketball is used as a model sun, what should be the diameter of the model Earth? 0.2 cm

10. If it took 1.5 qt of paint to paint the wall on the left, how many quarts will be needed to paint the wall on the right? 3 qt
How Do You Make Chicken Napoleon?

For these pairs of similar figures, find the length of each side marked with a variable. Round to the nearest tenth. Write each variable letter in the box containing the length of that side.

1. \( h \) = 19.1 in
2. Hint: The figure has been rotated.
3. \( e \) = 4.0 m
4. 10 cm
5. 42.2 m
6. 17.9 m
7. 48 m
8. 11.8 cm
9. AC = 30 ft
   AB = 13 ft
   EB = 8 ft
10. TR = 15.5 in
    SP = 20 in
    ST = 12 in
11. 75 m
12. 9.8 cm

<table>
<thead>
<tr>
<th>27.9 m</th>
<th>25.8 in</th>
<th>2.3 m</th>
<th>21.3 in</th>
<th>13.7 cm</th>
<th>42.2 ft</th>
<th>76.7 m</th>
<th>9.8 cm</th>
<th>19.3 ft</th>
<th>5.3 cm</th>
<th>19.1 in</th>
<th>15.3 in</th>
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</thead>
<tbody>
<tr>
<td>USE</td>
<td>ONLY</td>
<td>THE</td>
<td>BONY</td>
<td>PARTS</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>65.7 ft</td>
<td>613 m</td>
<td>71.6 ft</td>
<td>6.2 cm</td>
<td>41.5 m</td>
<td>8.8 cm</td>
<td>18.5 ft</td>
<td>6.7 ft</td>
<td>11.6 cm</td>
<td>17.9 in</td>
<td>16.3 cm</td>
<td>62.7 m</td>
</tr>
</tbody>
</table>

25
What Did Scientists Conclude After Discovering Bones on the Moon?

Choose the correct answer for each exercise and circle the letter pair next to it. Write the upper case letter in the box containing the lower case letter.

1. During the big storm, 29 in. of snow fell in 8 hours. Find the rate of snowfall in inches per hour.
   \[ p \cdot U \quad 3.8 \text{ in./h} \quad k \cdot D \quad 3.6 \text{ in./h} \]

2. A gas pump delivered 19.2 gal of gas in 3.5 min. Find the pumping rate in gallons per minute.
   \[ c \cdot E \quad 3.49 \text{ gal/min} \quad f \cdot V \quad 6.08 \text{ gal/min} \]

3. A boat propeller spins 1044 times in 3 min. Find the rate in revolutions per second.
   \[ u \cdot T \quad 5.8 \text{ rps} \quad b \cdot G \quad 4.7 \text{ rps} \]

4. Smallville is shaped like a rectangle 8 mi long and 5 mi wide. The town has a population of 72,450. Find the population per square mile.
   \[ r \cdot M \quad 1755 \text{ per mi}^2 \quad p \cdot A \quad 1811 \text{ per mi}^2 \]

5. Mr. Munch drove 169 miles in 3 h 30 min. Find these rates:
   a. miles per hour
      \[ q \cdot V \quad 47.6 \text{ mph} \quad j \cdot L \quad 48.3 \text{ mph} \]
   b. miles per minute
      \[ h \cdot C \quad 0.7 \text{ mi/min} \quad f \cdot O \quad 0.8 \text{ mi/min} \]
   c. feet per minute \((1 \text{ mi} = 5280 \text{ ft})\)
      \[ m \cdot T \quad 4249 \text{ ft/min} \quad t \cdot S \quad 4325 \text{ ft/min} \]
   d. feet per second
      \[ n \cdot Y \quad 68.4 \text{ ft/s} \quad b \cdot H \quad 70.8 \text{ ft/s} \]
   e. minutes per mile
      \[ i \cdot D \quad 1.24 \text{ min/mi} \quad q \cdot B \quad 1.32 \text{ min/mi} \]

6. Mom’s Market charges $2.89 for a six-pack of cola. Each can holds 12 fl oz. Find these unit prices:
   a. price per can
      \[ t \cdot E \quad $0.48 \text{ per can} \quad d \cdot N \quad $0.44 \text{ per can} \]
   b. price per fluid ounce
      \[ a \cdot T \quad $0.04 \text{ per oz} \quad o \cdot S \quad $0.07 \text{ per oz} \]

7. Frosted Oats cereal is sold in three sizes. The 48-oz box costs $6.79. The 32-oz box costs $5.39. The 20-oz box costs $3.79. Find these unit prices:
   a. price per ounce for the 48-oz box
      \[ l \cdot O \quad $0.16 \text{ per oz} \quad q \cdot K \quad $0.14 \text{ per oz} \]
   b. price per ounce for the 32-oz box
      \[ t \cdot I \quad $0.17 \text{ per oz} \quad e \cdot D \quad $0.15 \text{ per oz} \]
   c. price per ounce for the 20-oz box
      \[ s \cdot F \quad $0.22 \text{ per oz} \quad g \cdot W \quad $0.19 \text{ per oz} \]

8. Matt the Magnificent performed three 24-minute magic shows each night for one week. He was paid $800. Find the following:
   a. earnings per show
      \[ n \cdot H \quad \$37.50 \text{ /show} \quad i \cdot N \quad \$338.10 \text{ /show} \]
   b. earnings per minute of performing
      \[ h \cdot L \quad \$1.64 \text{ /min} \quad o \cdot M \quad \$1.59 \text{ /min} \]

9. When he left on vacation, the odometer in Carl’s car read 32,654 mi. When he returned, it read 33,895 mi. If he used 54.7 gal of gas, how many miles per gallon did he get?
   \[ e \cdot C \quad 22.7 \text{ mpg} \quad d \cdot R \quad 23.4 \text{ mpg} \]
## Percents

<table>
<thead>
<tr>
<th>Fraction to percent</th>
<th>Decimal to percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\frac{1}{2}$</td>
<td>$\frac{1}{2} = \frac{x}{100}$</td>
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<tr>
<td></td>
<td>$2x = 100$</td>
</tr>
<tr>
<td></td>
<td>$x = 50$</td>
</tr>
<tr>
<td></td>
<td>$\frac{1}{2} = 50%$</td>
</tr>
<tr>
<td>0.425</td>
<td>$0.425 \rightarrow 42.5%$</td>
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<tr>
<td></td>
<td>When converting a decimal</td>
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<tr>
<td></td>
<td>to a percent, move the decimal</td>
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<td>two places to the right.</td>
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</tbody>
</table>

Write each fraction or decimal as a percent. Round each answer to the nearest hundredth.

1. $\frac{7}{21} \rightarrow 0.33\ldots \rightarrow 33\%$
2. 10.8 \rightarrow 1080\%
3. 12.392 \rightarrow 1239.2\%
4. 523.32 \rightarrow 52332\%
5. 2.3839 \rightarrow 238.39\%
6. $\frac{12}{19} \rightarrow 63.16\%$
7. $\frac{5}{46} \rightarrow 10.87\%$
8. $\frac{11}{23} \rightarrow 47.83\%$
9. $\frac{4}{13} \rightarrow 30.77\%$
10. 2.32 \rightarrow 232\%
11. 17.45 \rightarrow 1745\%
12. 5.293 \rightarrow 529.3\%
### Percents

<table>
<thead>
<tr>
<th>Problem</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>50% of 60 = ____</td>
<td>50 \times \frac{x}{100} = 60 \times \frac{x}{100} = 3000 \Rightarrow x = 30</td>
</tr>
<tr>
<td>____% of 40 = 20</td>
<td>\frac{x}{100} = \frac{20}{40} \Rightarrow 40x = 2000 \Rightarrow x = 50 50%</td>
</tr>
<tr>
<td>40% of ____ = 30</td>
<td>\frac{40}{100} = \frac{30}{x} \Rightarrow 40x = 3000 \Rightarrow x = 75</td>
</tr>
</tbody>
</table>

Solve each problem.

1. 20% of 15 = 3
2. 30% of 60 = 18
3. 15% of 75 = 11.25
4. 37% of 65 = 24.05
5. 44% of 40 = 17.6
6. 42.86% of 35 = 15
7. __8.57__% of 70 = 20
8. __16.6__% of 48 = 8
9. __50.77__% of 65 = 33
10. __44.4__% of 9 = 4
11. 12% of __633.3__ = 76
12. 65% of __123.08__ = 80
13. 20% of __275__ = 75
14. 45% of __333.3__ = 150
15. 22% of __154.54__ = 34
16. 50% of __104__ = 52
Problem Solving with Percents

A baseball team played 30 games and won 50% of them. How many games did the team win?

\[
50\% \text{ of } 30 = \frac{50}{100} \cdot \frac{x}{30} \\
100x = 1500 \\
x = 15 \text{ games}
\]

Solve each problem. Show your work.

1. In a group of 35 students, 7 have yellow socks. What percentage of the students have yellow socks?
   \[20\%\]

2. A test has 60 questions. Fred answers 75% of them correctly. How many problems does Fred answer correctly?
   \[45 \text{ answers}\]

3. A football team plays 25 games. They win 32% of them. How many games does the team win?
   \[8 \text{ games}\]

4. The regular price of a pair of pants is $38.00. The pants are discounted 35%. How much do the pants cost after the discount is applied?
   \[$24.70\]

5. A store was having a sale on books. The book Bart wants is priced at $19.00. He has a coupon for 30% off. How much does the book cost after the coupon is applied?
   \[$13.30\]

6. Lisa went to a restaurant and gave the waiter a 15% tip. If the price of her meal was $10.25, how much did Lisa tip the waiter?
   \[$1.54\]

7. Emily bought a new car that cost $22,000. The car was 93% of the list price. How much was the list price?
   \[$23,655.91\]
Adding Integers with Like Signs

\[
\begin{align*}
5 + 5 &= 10 \text{ (positive)} & (-3) + (-10) &= -13 \text{ (negative)} \\
\text{2 positives} & & \text{2 negatives}
\end{align*}
\]

Solve each problem.

1. \((-13) + (-34) + (-67) = -114\)
2. \(90 + 52 = 142\)

3. \((-12) + (-7) = -19\)
4. \(5 + 6 = 11\)

5. \(32 + 53 = 85\)
6. \(23 + 54 + 56 = 133\)

7. \((-34) + (-76) = -110\)
8. \(142 + 374 = 516\)

9. \((-42) + (-36) + (-22) = -100\)
10. \(13 + 45 + 84 = 142\)

11. \((-35) + (-38) = -73\)
12. \(45 + 8 = 53\)

13. \((-16) + (-16) + (-16) = -48\)
14. \(15 + 41 + 7 = 63\)

15. \((-60) + (-39) = -99\)
16. \((-2) + (-124) + (-438) = -564\)

17. \((-12) + (-34) + (-46) + (-261) = -353\)
18. \(12 + 45 + 332 = 389\)

19. \((-16) + (-16) = -32\)
20. \(23 + 72 = 95\)
Adding Integers with Unlike Signs

\[
\begin{align*}
&4 + (-12) = -8 & -10 + 14 = 4 \\
&4 - 12 = -8 & 14 - 10 = 4
\end{align*}
\]

Solve each problem.

1. \(24 + (-67) = \boxed{-43}\)
2. \(-6,607 + 4,362 = \boxed{-2,245}\)

3. \(-194 + 635 = \boxed{441}\)
4. \(-23,895 + 5,863 = \boxed{-18,032}\)

5. \(321 + (-494) = \boxed{-173}\)
6. \(714 + (-6,976) = \boxed{-6,262}\)

7. \(-43 + 68 = \boxed{25}\)
8. \(131,985 + (-454,202) = \boxed{-322,217}\)

9. \(-343 + 439 = \boxed{96}\)
10. \(-112,956 + 564,258 = \boxed{451,302}\)

11. \(-595 + 630 = \boxed{35}\)
12. \(67,888 + (-78,952) = \boxed{-11,064}\)

13. \(55,980 + (-42,278) = \boxed{13,702}\)
14. \(-64,412 + 73,651 = \boxed{9,239}\)

15. \(-99 + 94 = \boxed{-5}\)
16. \(88 + (-34) = \boxed{54}\)

17. \(-84,154 + 89,343 = \boxed{5,189}\)
18. \(34,139 + (-56,913) = \boxed{-22,774}\)

19. \(-73 + 25 = \boxed{-48}\)
20. \(850 + (-828) = \boxed{22}\)
Subtracting Integers

\[ 6 - 10 = 6 + (-10) = -4 \quad 6 - (-10) = 6 + 10 = 16 \]

Add the opposite

Add the opposite

Solve each problem.

1. \(-8 - 3 = -11\)

2. \(56 - (-65) = 121\)

3. \(-52 - (-34) = -18\)

4. \(-19 - (-13) = -6\)

5. \(42 - 23 = 19\)

6. \(77 - 22 = 55\)

7. \(17 - 26 = -9\)

8. \(-594 - (-73) = -521\)

9. \(-117 - 29 = -146\)

10. \(-749 - 629 = -1,378\)

11. \(19 - (-342) = 361\)

12. \(2,567 - (-492) = 3,059\)

13. \(5,762 - 2,144 = 3,618\)

14. \(121 - 154 = -33\)

15. \(-8 - (-27) = 19\)

16. \(-87 - 129 = -216\)

17. \(45 - 75 = -30\)

18. \(688 - 456 = 232\)

19. \(187 - (-48) = 235\)

20. \(157 - (-452) = 609\)
Multiplying Integers

Like signs = Positive
Unlike signs = Negative

1. \((33)(-123)(12) = -48,708\)

2. \((-434)(-7) = 3,038\)

3. \((15)(-4) = -60\)

4. \((-5)(-28)(-23) = -3,220\)

5. \((30)(5) = 150\)

6. \((13)(-28) = -364\)

7. \((-72)(43) = -3,096\)

8. \((-3)(9) = -27\)

9. \((56)(12) = 672\)

10. \((14)(-33)(2) = -924\)

11. \((32)(-48) = -1,536\)

12. \((20)(-3)(23)(-3) = 4,140\)

13. \((-39)(-58) = 2,262\)

14. \((12)(-12)(2)(-33) = 9,504\)

15. \((-20)(-10)(2)(3) = 1,200\)

16. \((37)(-90) = -3,330\)

17. \((121)(-10)(21) = -25,410\)

18. \((-9)(-88)(-7) = -5,544\)

19. \((-13)(-13) = 169\)

20. \((-32)(-22)(-45) = -31,680\)
Dividing Integers

\[ \frac{-18}{-3} = 6 \quad 24 ÷ (-4) = -6 \]
Like signs = Positive \quad Unlike signs = Negative

Solve each problem.

1. \(100 ÷ (-4) = -25\)

2. \(\frac{-18}{18} = -1\)

3. \(-60 ÷ 3 = -20\)

4. \(\frac{-104}{8} = -13\)

5. \(120 ÷ (-6) = -20\)

6. \(\frac{-72}{7} = -11\)

7. \(88 ÷ (-22) = -4\)

8. \(\frac{36}{9} = -4\)

9. \(-188 ÷ 4 = -47\)

10. \(\frac{168}{21} = 8\)

11. \(144 ÷ (-12) = -12\)

12. \(\frac{-50}{-5} = 10\)

13. \(80 ÷ (-5) = -16\)

14. \(-36 ÷ 6 = -6\)

15. \(72 ÷ 4 = 18\)

16. \(\frac{169}{13} = -13\)

17. \(\frac{210}{10} = -21\)

18. \(\frac{-50}{-5} = 10\)

19. \(-150 ÷ 6 = -25\)

20. \(\frac{-288}{-12} = 24\)
Problem Solving with Integers

Solve each problem. Show your work.

1. A helicopter started out at an altitude of 0 feet. It then rose to an altitude of 2,150 feet. Then, it descended 400 feet in order to see a herd of bison. It then rose 4,200 feet in order to avoid a passing plane. After the plane passed, the helicopter descended 2,200 feet. What was the helicopter's altitude at the end?  

   3,750 feet

2. Julio goes to school in a 9-story building. His first class of the day is on the second floor. For his second class, Julio goes up 5 floors. For his third class, Julio goes down 1 floor. For his fourth class, Julio goes up 3 floors, and for his last class he goes down 2 floors. What floor is Julio on during his last class?  

   7th floor

3. Some number added to −12 is 45. Add this number to 30. Multiply the answer by 3. What is the final number?  

   261

4. Some number multiplied by −6 is 36. Multiply this number by 8. Divide the answer by 2. What is the final number?  

   −24

5. A bus driver started her day with no passengers. Then, 13 people got on at the first stop. At the second stop, 8 people got on and 6 left the bus. At the third stop, 5 people got on and 3 left the bus. How many people are on the bus after the third stop?  

   17 passengers

6. The school library started the year with 9,561 books. At the end of the first week of school, 1,625 books had been checked out. At the end of the second week, 5,140 books had been checked out. By the end of two weeks 913 books had been returned. How many books were in the library at the end of the second week?  

   3,709 books
Mixed Practice with Integers

Solve each problem.

1. \((625 \div 5) \times 0.2 = \frac{25}{1}\)

2. \(\frac{150}{(-5)} \times (-4) = 120\)

3. \(80 - (-22) = \frac{102}{1}\)

4. \(\frac{-555}{(-5)} \times (-6) = \frac{-666}{1}\)

5. \(-3 \times 5 = -15\)

6. \(\frac{-424}{4} = -106\)

7. \(19 - 23 = -4\)

8. \(\left(\frac{-72}{9}\right) + \left(\frac{-64}{8}\right) + \left(\frac{44}{11}\right) = -20\)

9. \(83 + (-85) = -2\)

10. \((-34) + (-255) = -289\)

11. \(28 - (-65) = 93\)

12. \(28 - (-26) = 54\)

13. \([-19 - (-21) - (-34)] \div (-6) = -6\)

14. \([-18 - (-66) - 22] \times 2 = 52\)

15. \(-61 - (-21) = -40\)

16. \((16 - 21 + 34) \div (-8) = -3\frac{5}{8}\)

17. \(-35 + 62 + (-80) = -53\)

18. \([10 + (-31) + (-80)] \div 3 = -33\frac{2}{3}\)

19. \((-13 - 54 - 30) \times 2 = -194\)

20. \([-160 + (-75) + 24] \times 4 = -844\)

21. \(56 \times 3 \times 21 = 3,528\)

22. \((-12 + 13 + 55) \div 3 = 18\frac{2}{3}\)
Algebra: Solving Equations

Solve each equation. Check your solution.

1. \( x - 16 = -38 \)
   \[
   \begin{array}{c}
   +16 \\
   \hline
   \end{array}
   \]
   \( x = -22 \)

2. \( 2w = -64 \)
   \( w = -32 \)

3. \( -9s = -63 \)
   \( s = 7 \)

4. \( y - (-12) = 16 \)
   \( y = 4 \)

5. \( -15 + a = -32 \)
   \( a = -17 \)

6. \( q + (-63) = -100 \)
   \( q = -37 \)

7. \( \frac{k}{5} = 18 \)
   \( k = 90 \)

8. \( \frac{m}{-6} = -9 \)
   \( m = 54 \)

9. \( x - 240 = 78 \)
   \( x = 318 \)

10. \( -17 = \frac{n}{4} - 18 \)
    \[
    \begin{array}{c}
    +13 \\
    \hline
    \end{array}
    \]
    \( 4 \cdot -4 = n \cdot 4 \)
    \( -16 = n \)

11. \( 25 = \frac{n}{6} + (-19) \)
    \( n = -264 \)

12. \( -6y = -960 \)
    \( y = 160 \)

13. \( 18w = -234 \)
    \( w = -13 \)

14. \( 2,294 = -74t \)
    \( -31 = t \)

15. \( 49 = -9y - 68 \)
    \( -13 = y \)

16. \( 375 = 14x + (-17) \)
    \[
    \begin{array}{c}
    +17 \\
    \hline
    \end{array}
    \]
    \( 392 = 14x \)
    \( x = 28 \)

17. \( -12y - 14 = 142 \)
    \( y = -13 \)

18. \( 15x + 36 = -249 \)
    \( x = -19 \)
What Is the World’s Longest Punctuation Mark?

For each exercise, write the letter of the answer in the box containing the exercise number.

In Exercises 1-2, circle the expression that does not represent the area of the outside (largest) rectangle. Write its letter in the corresponding numbered box.

1. \[ x \text{ y} \]
   - S. \(4(x + y)\)
   - K. \(4x + 4y\)
   - T. \(4 + xy\)

2. \[ b \text{ 7} \]
   - H. \(ab + 7\)
   - R. \(a(b + 7)\)
   - A. \(ab + 7a\)

In Exercises 3-22, use the distributive property to complete each statement.

3. \(9(a + b) = 9a + \underline{9b}\)
4. \(3(n + 7) = \underline{3n} + 21\)
5. \(2(15 + q) = \underline{30} + 2q\)
6. \(a(b + 8) = ab + \underline{8a}\)
7. \(x(x + 5) = \underline{x^2} + 5x\)
8. \(15(y + 3) = 16y + \underline{48}\)
9. \(e(s + t) = es + \underline{et}\)
10. \(7(p + q + 4) = 7p + 7q + \underline{28}\)
11. \(a(b + c + 11) = \underline{ab} + ac + 11a\)
12. \(k(8 + 3 + k) = 8k + 3k + \underline{k^2}\)
13. \(7x + 7y = 7(x + \underline{y})\)
14. \(3m + 3n = 3(\underline{m} + n)\)
15. \(8a + 8b = \underline{8}(a + b)\)
16. \(ax + ay = \underline{a}(x + y)\)
17. \(nt + 4n = n(t + \underline{4})\)
18. \(2d + 12 = 2(\underline{d} + 6)\)
19. \(5e + 35 = 5(e + \underline{7})\)
20. \(x^2 + 9x = x(\underline{x} + 9)\)
21. \(4p + 4q + 80 = 4(p + q + \underline{20})\)
22. \(kw + wy + w^2 = w(k + y + \underline{w})\)

Answers for 3-12:
- U. 48
- O. 3n
- N. 30
- E. 9b
- D. 28
- E. \(k^2\)
- T. 5c
- H. \(x^2\)
- N. et
- E. 8a
- R. \(ab\)
- S. 3k

Answers for 13-22:
- H. \(w\)
- D. \(y\)
- B. \(k\)
- M. \(m\)
- R. \(d\)
- T. \(a\)
- L. 15
- E. 8
- D. 7
- E. 4
- S. 20
- A. \(x\)

THE ONE HUNDRED METER DASH
Adding and Subtracting Real Numbers

\[
\begin{array}{c}
-4 + (-3) + 2 \frac{1}{3} = -7 + 2 \frac{1}{3} = -6 \frac{3}{3} + 2 \frac{1}{3} = -4 \frac{2}{3}
\end{array}
\]

Solve each problem.

1. \(-3 + (-3 \frac{1}{4}) - (-3 \frac{3}{8}) = -2 \frac{7}{8} \)

2. \(-5 \frac{2}{3} - (-6 \frac{1}{5}) + 1 \frac{7}{12} = 2 \frac{7}{60} \)

3. \(-2 + 6 \frac{1}{5} + (-4 \frac{1}{3}) = -\frac{2}{15} \)

4. \(-6 - 2 \frac{3}{5} + (-7 \frac{2}{5}) = -16 \)

5. \(17.65 + (-5 \frac{1}{10}) + 13 \frac{2}{5} = 25 \frac{19}{50} \)

6. \(7 \frac{1}{7} - (-9.33) + 7 \frac{4}{7} = 24 \frac{1}{70} \)

7. \(5 \frac{5}{12} + (-6.44) - 14.69 = -15 \frac{107}{150} \)

8. \(7 \frac{4}{13} - (-9.21) - 16.32 = -18 \frac{289}{1300} \)

9. \(-1 + (-2 \frac{1}{3}) + (-7 \frac{3}{5}) = -10 \frac{14}{15} \)

10. \(13.23 - (-31.73) = 44 \frac{24}{25} \)

11. \(2 \frac{5}{7} - (-5 \frac{6}{9}) + \frac{1}{3} = 8 \frac{5}{7} \)

12. \(5 \frac{5}{8} - (-7 \frac{2}{3}) - \frac{1}{9} = 13 \frac{13}{72} \)

13. \(4.38 + (-4.38) = 0 \)

14. \(7 + 13.3 + (-9 \frac{1}{6}) = 11 \frac{2}{15} \)

15. \(4 \frac{1}{5} + (-4.34) - 7 \frac{1}{4} = -7 \frac{39}{100} \)

16. \(17 - 12.2 + (-9 \frac{2}{5}) = -4 \frac{3}{5} \)

17. \(12.26 - (-7 \frac{2}{5}) + 18 \frac{1}{4} = 37 \frac{91}{100} \)

18. \(-3 \frac{2}{3} + (-5 \frac{5}{12}) = -9 \frac{1}{12} \)
Multiplying and Dividing Real Numbers

\[
\begin{align*}
2 \times 3 \times \frac{1}{2} &= 6 \times \frac{1}{2} = \frac{6}{1} \times \frac{1}{2} = 3 \\
2 \frac{1}{2} \times 1 \frac{3}{4} \div 1 \frac{1}{2} &= \frac{5}{2} \times \frac{7}{4} \div \frac{3}{2} = \frac{5}{2} \times \frac{7}{4} \times \frac{2}{3} = \frac{35}{12} = 2 \frac{11}{12}
\end{align*}
\]

Solve each problem.

1. \(2 \frac{1}{3} \div 1 \frac{1}{2} \times \frac{5}{6} = \frac{8}{27}\)

2. \(2 \frac{1}{7} \div (-3.56) = -\frac{875}{973}\)

3. \(-3 \times 2 \frac{1}{5} \times (-7 \frac{1}{3}) = 48 \frac{2}{5}\)

4. \(7 \div 2.5 \times (-3 \frac{2}{5}) = -9 \frac{13}{25}\)

5. \(-8 \frac{2}{3} \times 3 \frac{7}{15} = -30 \frac{2}{45}\)

6. \(5 \frac{1}{3} \times 9.80 \times 0 = 0\)

7. \(1 \frac{5}{12} \times 3.29 = 11 \frac{793}{1200}\)

8. \(11 \times 3 \frac{1}{12} \times (-3) = -101 \frac{3}{4}\)

9. \(7 \times (-2 \frac{1}{3}) \times 2 = -32 \frac{2}{3}\)

10. \((-3 \frac{1}{4})(-3 \frac{1}{4}) \div 2 = 5 \frac{9}{32}\)

11. \(5 \frac{1}{2} \div (-3 \frac{1}{6}) = -1 \frac{14}{19}\)

12. \(2 \frac{2}{3} \times (-6 \frac{1}{5}) = -16 \frac{8}{15}\)

13. \(-6.3 \times 2 \times \frac{1}{2} = -6 \frac{3}{10}\)

14. \(10 \div 12.1 \div (-6 \frac{1}{6}) = -\frac{600}{4477}\)

15. \(9.21 \times (-7 \frac{1}{3}) \div 25 \frac{5}{9} = -2.643\)

16. \(6.21 \times (-1.37) = -8.5077\)

17. \(10.6 \div (-2 \frac{1}{2}) \times 3 \frac{1}{4} = -13 \frac{39}{60}\)

18. \(3.6 \times (-31.72) = -114.192\)
Order of Operations with Real Numbers

\[-4 \times 2 + 2 = -8 + 2 = -6\]
\[2 \frac{1}{4} \div (4 + 8) = \frac{9}{8} \div 12 = \frac{9}{8} \times \frac{1}{12} = \frac{9}{96} \text{ or } \frac{3}{32}\]

Solve each problem. Use the order of operations rules.

1. \(2 \times 3 [7 + (6 \div 2)] = \) 60

2. \(\frac{2}{3} (-15 - 4) = -12 \frac{2}{3}\)

3. \(-8 \div (-2) + 5 \times (-\frac{1}{2}) - 25 \div 5 = -3 \frac{1}{2}\)

4. \(-30 \div 6 + 4 \frac{1}{5} = - \frac{4}{5}\)

5. \((9 \frac{1}{3} + 4 \frac{1}{3}) \div 6 - (-12) = 14 \frac{5}{18}\)

6. \(\frac{[60 \div 4 + 35]}{(-12 + 35)} = 2 \frac{4}{23}\)

7. \(\frac{3}{4} [(-15 + 4) + (6 + 7) \div (-3)] = -11 \frac{1}{2}\)

8. \(3[-3(2 - 8) - 6] = 36\)
Evaluating Expressions

If \( w = \frac{1}{5}, \) \( x = 4, \) and \( y = -5, \)
then \( 3x(5w + 2y) = 3 \cdot 4[5(\frac{1}{5}) + 2(-5)] = 12(1 - 10) = 12(-9) = -108 \)

Evaluate each expression if \( w = \frac{1}{5}, \) \( x = 4, \) and \( y = -5. \)

1. \( y(w + 7) = -\frac{26}{5} \)

2. \( 3w + 4(x - y) = \frac{36}{5} \)

3. \( 6[w + (-y)] = \frac{31}{5} \)

4. \( wx + x + 6xy = -115 \frac{1}{5} \)

5. \( 5(w - 2y) = 5 \)

6. \( w(x + y) = -\frac{1}{5} \)

7. \( w(xw + xy) = -\frac{321}{25} \)

8. \( 7w - (xy + 3) = 18 \frac{2}{5} \)

9. \( 3w(3y + 5x) = 3 \)

10. \( wx(3w + 3y - 6) = -16 \frac{8}{25} \)

11. \( 3w - 4x = -15 \frac{2}{5} \)

12. \( 10y(4y + 2w) = 980 \)

13. \( 8x + (-12x) = -16 \)

14. \( 4w - 7x + 3y - 2w = -42 \frac{3}{5} \)
A Cross-Number Puzzle

Use the clues at the bottom of the page to complete the puzzle.
You are to write one digit in each box.

### Across

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
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<tbody>
<tr>
<td>2</td>
<td>1</td>
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<td>2</td>
<td>0</td>
<td>U</td>
<td>3</td>
<td>2</td>
</tr>
</tbody>
</table>

### Down

1. $x^2 - 4$ for $x = 5$, $25 - 4 = 21$
2. $3xy^2$ for $x = 4$ and $y = -1$
3. $(2x + 50) + (x - 15)$ for $x = 0$
4. $x^2 - 4x - y^2$ for $x = 10$ and $y = 5$
5. $x^2$ for $x = 3$ and $y = 7$
6. $10w + 5y$ for $w = 6$ and $y = 1$
7. $3x^2 + 5x + 8$ for $x = -10$
8. $(y - 8) + (10 - 4y)$ for $y = -6$
9. $23x - 16x$ for $x = 11$
10. $7x + 100y$ for $x = 5$ and $y = 6$
11. $(6x^2 - 2) + (4x^2 - 3)$ for $x = -7$
12. $(x^2 - x + 7) + (x^2 - 2)$ for $x = 3$
13. $x^2y$ for $x = -2$ and $y = 8$
14. $7y - 12y - 2$ for $y = -10$
15. $w^2 - w - 7$ for $w = 9$

### Clues

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
</tr>
</thead>
</table>
| A | (6$x^2 - 1$) + (4$x^2 - 3$) for $x = 5$
| B | 7$y + 8y - 2$ for $y = 1$
| C | $x + x^2y^2$ for $x = 7$ and $y = 1$
| D | 5(7$w + 3w$) for $w = 10$
| E | ($z^2 + 2z + 1$) + ($z^2 - 2z - 2$) for $z = 4$
| F | 6$xy^2 - xy + 60$ for $x = 10$ and $y = 10$
| G | $w^2 - w - 3$ for $w = 6$
| H | (3$y - 20$) + (45 - 3$y$) for $y = 16$
| I | 11$x^2 - 8x^2$ for $x = -5$
| J | $x^2 - 2x + y^2$ for $x = 10$ and $y = 8$
| K | (2$x + 52$) + ($x - 11$) for $x = -3$
| L | 2$x^2 - 5x - 140$ for $x = 12$
| M | ($y - 75$) + (120 + 4$y$) for $y = -6$
# How Was the Wooden Marionette Related to the Wooden Hockey Stick?

Find each answer in the adjacent answer columns. Write the letter of the answer in the box containing the number of the exercise.

<table>
<thead>
<tr>
<th>Evaluate for $x = 4$.</th>
<th></th>
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<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>1. $9x$</td>
<td>36</td>
<td>2. $2x + 7$</td>
<td>15</td>
<td>3. $x^2$</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>4. $\frac{5x}{2}$</td>
<td>10</td>
<td>5. $3x^2$</td>
<td>48</td>
<td>6. $(3x)^2$</td>
<td>144</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Evaluate for $a = 7$ and $b = 2$.</th>
<th></th>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>7. $6ab$</td>
<td>84</td>
<td>8. $8a - 5b$</td>
<td>46</td>
<td>9. $ab^2$</td>
<td>28</td>
<td></td>
</tr>
<tr>
<td>10. $a^2 + b^2$</td>
<td>53</td>
<td>11. $(a + b)^2$</td>
<td>81</td>
<td>12. $(a - b)^3$</td>
<td>125</td>
<td></td>
</tr>
<tr>
<td>13. $\frac{4a + 6b}{5}$</td>
<td>8</td>
<td>14. $b^3(a - 2b)$</td>
<td>24</td>
<td>15. $\frac{a^2b + 1}{a + b}$</td>
<td>11</td>
<td></td>
</tr>
</tbody>
</table>

The number of diagonals for a polygon is given by the formula: $T = \frac{n(n - 3)}{2}$, where $n$ is the number of sides.

Find $T$ if

<p>| | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>16. $n = 6$</td>
<td>9</td>
<td>17. $n = 10$</td>
<td>35</td>
<td>18. $n = 20$</td>
<td>170</td>
<td></td>
</tr>
</tbody>
</table>

The distance traveled by a moving object is given by the formula: $d = rt$, where $r$ is speed and $t$ is time.

Find $d$ if

<p>| | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>19. $r = 60$ mph</td>
<td></td>
<td>20. $r = 96$ m/s</td>
<td></td>
<td>21. $r = 300$ ft/min</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$t = 3.5$ h</td>
<td></td>
<td>$t = 15$ s</td>
<td></td>
<td>$t = 5.2$ min</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$210$ mi</td>
<td></td>
<td>$1440$ m</td>
<td></td>
<td>$1560$ ft</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The volume of a square pyramid is given by the formula: $V = \frac{hw^2}{3}$, where $h$ is height and $w$ is a side of the base.

Find $V$ if

<p>| | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>22. $h = 9$ cm</td>
<td></td>
<td>23. $h = 5$ in.</td>
<td></td>
<td>24. $h = 3$ ft</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$w = 4$ cm</td>
<td></td>
<td>$w = 6$ in.</td>
<td></td>
<td>$w = 10$ ft</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$48$ cm$^3$</td>
<td></td>
<td>$60$ in$^3$</td>
<td></td>
<td>$100$ ft$^3$</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<p>| | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>THEY</td>
<td>HAD</td>
<td>THE</td>
<td>SAME</td>
<td>FAMILY</td>
<td>TREE</td>
<td></td>
</tr>
</tbody>
</table>
What Did the Math Teacher Say After Spending 8 Hours in the Ice and Snow?

For each problem, label a variable (let \( x \) be the unknown), then write and solve an equation. Find your equation in the column at the right. Write the letter of the equation in the box at the bottom that contains the solution to the problem.

1. A set of 8 dessert dishes cost $20. What was the cost of each dish? \( 8x = 20 \)
   \[ x = \frac{20}{8} = 2.50 \]

2. Ben and Jerry together own 24 comic books. If Ben owns 6 comic books, how many does Jerry own? \( x + 6 = 24 \)
   \[ x = 18 \]

3. Hans Klobber sells vacuum cleaners. He gets to keep one eighth of his sales as a commission. How much must he sell in order to earn $1000? \( \frac{1}{8}x = 1000 \)
   \[ x = 8000 \]

4. On first down, a football team lost 8 yd. After two downs, the team had an overall gain of 20 yd. How many yards were gained on second down? \(-8 + x = 20\)
   \[ x = 28 \text{ yd} \]

5. After she wrote a check for $240, May Bounce had a balance in her checking account of $-6. What was her balance before she wrote the check? \( x - 240 = -6 \)
   \[ x = 234 \]

6. A bank of 8 floodlights together use 1000 watts of power. How much power is used by each bulb? \( 8x = 1000 \)
   \[ x = 125 \text{ W} \]

7. Between noon and midnight, the temperature dropped 20°F. If the temperature was -8°F at midnight, what was the temperature at noon? \( x - 20 = -8 \)
   \[ x = 12 \text{°F} \]

8. If a strawberry pie is divided into 6 equal slices, each slice has 240 calories. How many calories are in the whole pie? \( \frac{x}{6} = 240 \)
   \[ x = 1440 \text{ cal} \]

9. A chest was resting on the ocean floor 1000 ft below the surface. It was lifted to the deck of a ship 8 ft above the surface. How far was the chest lifted? \(-1000 + x = 8 \)
   \[ x = 1008 \text{ ft} \]

10. When all the kids who tried out for Little League were divided into teams of 20 players, there were exactly 8 teams. How many kids tried out? \( \frac{x}{20} = 8 \)
    \[ x = 160 \]

**Equations**

- \( R \frac{x}{8} = 1000 \)
- \( S x + 8 = 1000 \)
- \( M \frac{x}{20} = 8 \)
- \( B 8x = 20 \)
- \( N \frac{x}{6} = 240 \)
- \( U -8 + x = 20 \)
- \( E 6x = 240 \)
- \( R -1000 + x = 8 \)
- \( B 8x = 1000 \)
- \( M x + 6 = 24 \)
- \( T \frac{x}{8} = -20 \)
- \( I x - 240 = -6 \)
- \( A x - 20 = -8 \)

<table>
<thead>
<tr>
<th>184</th>
<th>$234</th>
<th>175 W</th>
<th>12°F</th>
<th>18</th>
<th>968 ft</th>
<th>1440 cal</th>
<th>28 yd</th>
<th>100</th>
<th>$2.50</th>
<th>26°F</th>
<th>125 W</th>
<th>1008 ft</th>
<th>$8000</th>
<th>32 yd</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>A</td>
<td>M</td>
<td>N</td>
<td>U</td>
<td>M</td>
<td>B</td>
<td>R</td>
<td>R</td>
<td>I</td>
<td>A</td>
<td>B</td>
<td>R</td>
<td>R</td>
<td>I</td>
</tr>
</tbody>
</table>
What Do You Get When You Cross the Atlantic with the Titanic?

Find each answer at the bottom of the page and cross out the letter above it (some are rounded).

1. Practice times for five swimmers in the 50-meter freestyle are given in the table. Find the following:
   a. The mean of Mike’s times. \(32.5\ s\)
   b. The mean of Jason’s times. \(39.8\ s\)
   c. The mean of the times on Trial 1. \(34.3\ s\)
   d. The median of Ryan’s times. \(33.6\ s\)
   e. The median of the times on Trial 4. \(33.4\ s\)
   f. The mode of all 20 times in the table. \(33.8\ s\)

<table>
<thead>
<tr>
<th>Name</th>
<th>Trial 1 (s)</th>
<th>Trial 2 (s)</th>
<th>Trial 3 (s)</th>
<th>Trial 4 (s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mike</td>
<td>34.1</td>
<td>33.8</td>
<td>30.5</td>
<td>31.6</td>
</tr>
<tr>
<td>Alan</td>
<td>32.5</td>
<td>33.3</td>
<td>34.0</td>
<td>33.8</td>
</tr>
<tr>
<td>Jason</td>
<td>41.7</td>
<td>40.0</td>
<td>39.2</td>
<td>38.4</td>
</tr>
<tr>
<td>Scott</td>
<td>29.4</td>
<td>29.4</td>
<td>31.0</td>
<td>31.6</td>
</tr>
<tr>
<td>Ryan</td>
<td>33.8</td>
<td>32.5</td>
<td>33.8</td>
<td>33.4</td>
</tr>
</tbody>
</table>

2. The weekly salary for 10 people is given in the table. Find:
   a. The mean salary. \(\$760\)
   b. The median salary. \(\$550\)
   c. The mode of the salaries. \(\$500\)

<table>
<thead>
<tr>
<th>Weekly Salary</th>
<th>No. of People</th>
</tr>
</thead>
<tbody>
<tr>
<td>$2400</td>
<td>1</td>
</tr>
<tr>
<td>$900</td>
<td>1</td>
</tr>
<tr>
<td>$600</td>
<td>3</td>
</tr>
<tr>
<td>$500</td>
<td>5</td>
</tr>
</tbody>
</table>

3. The mean weight of 32 math students is 98.3 lb. If the students could all stand on the scale together, what would their total weight be? \(\$145.6\ lb\)

4. The Pie Arsquare Bakery sold 869 pies during the month of January. What was the mean number of pies sold per day? \(29\)

5. Julie has taken 5 tests in science this semester. On the first three tests, her mean score was 70%. On the last two tests, her mean score was 90%. What is the mean of all five scores? \(78.9\%\)

6. On his trip to the mountains, Klink drove for 3 hours at an average speed of 50 mph, then for 2 hours at an average speed of 30 mph. What was his average speed for the entire trip? \(42\ mph\)

7. As an experiment, Rex tossed 3 coins together and counted the number of heads. He repeated the experiment 25 times. The outcomes are given in the table. What is the mode?

<table>
<thead>
<tr>
<th>Tossing 3 Coins: Number of Heads</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 0 2 3 2</td>
</tr>
<tr>
<td>1 3 2 0 1</td>
</tr>
<tr>
<td>2 2 1 1 2</td>
</tr>
<tr>
<td>0 3 1 2 1</td>
</tr>
<tr>
<td>2 1 1 2 3</td>
</tr>
</tbody>
</table>

8. Marissa has taken four 100-point tests in math this semester. Her mean score is 89%.
   a. How many points has she scored altogether on the four tests? \(356\)
   b. What score does she need on test #5 so that the mean of all five scores will be 90%? \(94\%\)
Which Italian Insects Often Fall in Love?

Find each correct answer in the set of answers under the exercise and cross out the letter above it.

1. Each time you spin this spinner, how many equally likely outcomes are there? \(10\)

2. Find each probability if you spin the spinner once.
   a. \(P(\text{even number}) = \frac{2}{5}\)
   b. \(P(\text{odd number}) = \frac{1}{2}\)
   c. \(P(\text{A}) = \frac{1}{10}\)

3. If you spin the spinner 100 times, about how many times would you expect it to stop on:
   a. an even number \(40\)
   b. an odd number \(50\)

4. If you roll a regular 6-faced die 1200 times, about how many times would you expect to get a 4? \(200\)

5. If a raindrop falls on this set of tiles, how many equally likely outcomes are there? \(25\)

6. Find each probability if a raindrop falls on the tiles.
   a. \(P(\text{falling on black}) = \frac{9}{25}\)
   b. \(P(\text{falling on white}) = \frac{16}{25}\)
   c. \(P(\text{falling on green}) = 0\)

7. If 100 raindrops fall on the tiles, about how many of them would you expect to fall on:
   a. a black tile \(36\)
   b. a white tile \(64\)

8. Jack rolled a regular 6-faced die three times and got 2 each time. What is the probability he will get 2 on the next roll? \(\frac{6}{6}\)

9. Suppose a bag contains 12 green cubes, 5 blue cubes, and 3 yellow cubes. Find each probability if you choose one cube at random:
   a. \(P(\text{green}) = \frac{3}{20}\)
   b. \(P(\text{blue}) = \frac{1}{20}\)
   c. \(P(\text{yellow}) = \frac{3}{20}\)
   d. \(P(\text{not blue}) = \frac{3}{4}\)

10. If you spin this spinner 600 times, about how many times would you expect it to stop on:
    a. \(\$1\) \(300\)
    b. \(\$5\) \(200\)
    c. \(\$10\) \(100\)

11. Jill tossed a coin 10 times and got heads every time. What is the probability she will get heads on the next toss? \(\frac{1}{2}\)

12. A traffic signal is green for 20 seconds, then amber for 5 seconds, then red for 30 seconds. When you reach the signal, what is the probability it is:
    a. green \(\frac{4}{11}\)
    b. amber \(\frac{1}{11}\)

13. Suppose you do a survey to find the blood types of 200 people and obtain the results in the table. Based on this data, find the probability that a randomly chosen person has:
    a. Type \(O^+\) \(\frac{19}{50}\)
    b. Type \(A^-\) \(\frac{3}{50}\)
    c. Type \(B^-\) \(\frac{1}{50}\)
    d. Type \(AB^+\) or \(AB^-\) \(\frac{1}{25}\)

<table>
<thead>
<tr>
<th>Blood Type</th>
<th>People</th>
</tr>
</thead>
<tbody>
<tr>
<td>O^+</td>
<td>76</td>
</tr>
<tr>
<td>O^-</td>
<td>14</td>
</tr>
<tr>
<td>A^+</td>
<td>68</td>
</tr>
<tr>
<td>A^-</td>
<td>12</td>
</tr>
<tr>
<td>B^+</td>
<td>18</td>
</tr>
<tr>
<td>B^-</td>
<td>4</td>
</tr>
<tr>
<td>AB^+</td>
<td>6</td>
</tr>
<tr>
<td>AB^-</td>
<td>2</td>
</tr>
</tbody>
</table>

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