

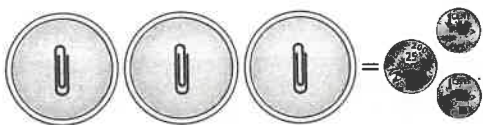
Check Your Understanding

Communicate the Ideas

- To solve the equation $\frac{y}{2} = \frac{5}{3}$, John first multiplied both sides by 3.
 - Do you think that John's first step is the best way to isolate the variable y ? Explain.
 - How would you solve the equation?
- When Ming solved $0.3g = 0.8$, her value for g was 2.666... She expressed this to the nearest tenth, or 2.7. When Ming checked by substitution, she found that the left side and the right side did not exactly agree.
 Left Side = $0.3g$ Right Side = 0.8
 = $0.3(2.7)$
 = 0.81
 - How could Ming make the left side and right side agree more closely?
 - Did Ming's check show that the solution was correct? Explain.
- The length of Shamika's stride is 0.75 m. Both Amalia and Gustav were trying to calculate how many strides it would take Shamika to walk 30 m from her home to the bus stop.
 - Amalia represented the situation with the equation $0.75p = 30$. Explain her thinking.
 - Gustav represented the situation with the equation $\frac{30}{p} = 0.75$. Explain his thinking.
 - Whose equation would you prefer to use? Explain.

Practise

- Write an equation that is represented by the model shown. Then, solve it.



For help with #5 to #7, refer to Example 1 on pages 294–296.

- Model the solution to the equation $4x = \frac{3}{4}$ using a number line.
- Solve.
 - $2v = \frac{-5}{6}$
 - $\frac{x}{2} = \frac{2}{5}$
 - $\frac{4}{3} = -1\frac{1}{4}a$
 - $-1\frac{1}{2}x = -2\frac{1}{4}$

- Solve.

a) $\frac{3}{5} = \frac{x}{4}$

b) $2y = -\frac{6}{5}$

c) $-\frac{7}{6} = -\frac{4}{3}n$

d) $2\frac{2}{3}w = 1\frac{1}{6}$

For help with #8 and #9, refer to Example 2 on page 297.

- Solve and check.

a) $-5.6x = 3.5$

b) $\frac{e}{-2.2} = -0.75$

- Solve.

a) $\frac{h}{4.1} = 3.6$

b) $1.472 = 0.46c$

For help with #10 and #11, refer to Example 3 on page 298.

10. Solve and check.

a) $-5.5 = \frac{1.1}{a}$

b) $\frac{4.8}{m} = 6.4$

11. Solve. Express each solution to the nearest hundredth.

a) $\frac{2.02}{n} = 0.71$

b) $-7.8 = \frac{-4.3}{x}$

Apply

12. The average speed of a vehicle, s , is represented by the formula

$s = \frac{d}{t}$ where d is the distance driven and t is the time.

- a) If Pablo drove at an average speed of 85 km/h for 3.75 h, what distance did he drive?
b) If Sheila drove 152 km at an average speed of 95 km/h, how much time did her trip take?

13. A roll of nickels is worth \$2.00. Write and solve an equation to determine the number of nickels in a roll.



14. Write and solve an equation to determine the side length, s , of a square with a perimeter of 25.8 cm.

15. Without solving the equation $-\frac{5}{d} = -1.3$, predict whether d is greater than or less than 0. Explain your reasoning.

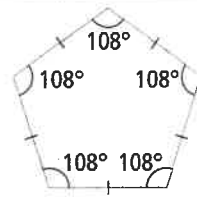
16. The diameter, d , of a circle is related to the circumference, C , by the formula $\frac{C}{d} = \pi$.

Calculate the diameter of a circle with a circumference of 54.5 cm. Express your answer to the nearest tenth of a centimetre.

17. A regular polygon has a perimeter of 34.08 cm and a side length of 5.68 cm. Identify the polygon.

Literacy Link

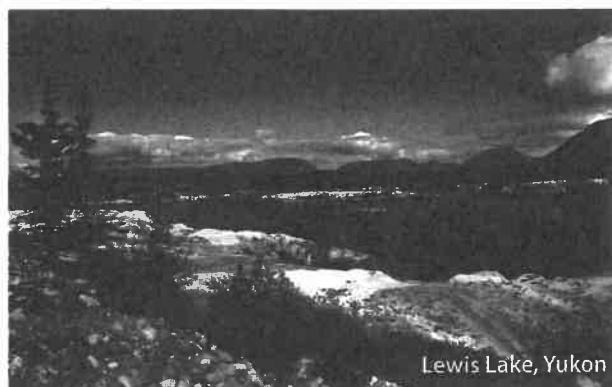
A regular polygon has equal sides and equal angles. For example, a regular pentagon has five equal sides. Each angle measures 108° .



18. One year, a student council sold 856 copies of a school yearbook. Four fifths of the $\frac{4}{5}$ students at the school bought a copy. How many students did not buy a yearbook?

19. A score of 17 on a math test results in a mark of 68%. What score would give you a mark of 100%?

20. The area of Nunavut is about $4\frac{3}{8}$ times the area of the Yukon Territory. Nunavut covers 21% of Canada's area. What percent of Canada's area does the Yukon Territory cover?



21. Dianne spends 40% of her net income on rent and 15% of her net income on food. If she spends a total of \$1375 per month on rent and food, what is her net monthly income?

22. Ellen and Li play on the same basketball team. In one game, Ellen scored one tenth of the team's points and Li scored one fifth of the team's points. Together, Ellen and Li scored 33 points. How many points did the team score altogether?

23. Sailaway Travel has a last-minute sale on a Caribbean cruise at 20% off. Their advertisement reads, "You save \$249.99." What is the sale price of the cruise?

24. Organizers of the Canadian Francophone Games hope to attract 500 volunteers to help host the games. The organizers predict that there will be about three and half times as many experienced volunteers as first-time volunteers. About how many first-time volunteers do they expect to attract?

25. A square piece of paper is folded in half to make a rectangle. The perimeter of the rectangle is 24.9 cm. What is the side length of the square piece of paper?

Extend

26. Solve.

a) $\frac{1}{3} + \frac{1}{6} = \frac{5}{6}x$

b) $\frac{0.45}{1.8} = \frac{0.81}{z}$

c) $\frac{y}{4} - \frac{y}{3} = -\frac{1}{10}$

d) $\frac{f}{0.55} = 2.6 - 3.5$

27. Solve. Express each solution to the nearest hundredth.

a) $0.75 + 1.23 = -3.9t$

b) $\frac{6.3}{h} = 2(-4.05)$

28. Solve and check.

a) $x \div \frac{1}{2} = -\frac{3}{4}$

b) $t \div \left(-\frac{2}{3}\right) = -\frac{1}{2}$

c) $\frac{5}{6} \div y = \frac{2}{3}$

d) $-\frac{2}{5} \div g = \frac{3}{10}$

29. a) A jar contains equal numbers of nickels and dimes. The total value of the coins is \$4.05. How many coins are in the jar?

- b) A jar contains a mixture of nickels and dimes worth a total of \$4.75. There are three times as many nickels as dimes. How many dimes are there?

30. A cyclist is travelling six times as fast as a pedestrian. The difference in their speeds is 17.5 km/h. What is the cyclist's speed?

Math Link

Solve parts a) and b) in at least two different ways. Write and solve an equation as one of the methods for each part. Share your solutions with your classmates.

Three dried figs contain about 1.2 mg of iron.

- a) What is the mass of iron in one dried fig?
- b) Teenagers need about 12 mg of iron per day. How many dried figs would you have to eat to get your recommended daily amount of iron?
- c) Write a formula that relates the mass of iron to the number of figs. Use your equation to calculate the mass of iron in eight figs.
- d) Use your formula in part c) to determine the number of figs that contain 1.8 mg of iron.

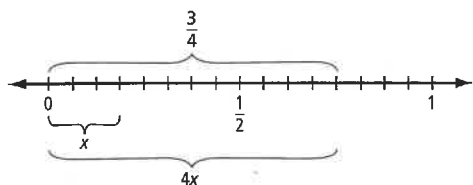


Chapter 8

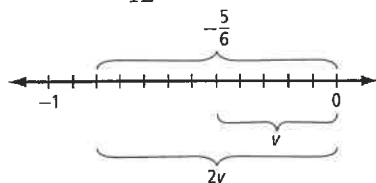
8.1 Solving Equations: $ax = b$, $\frac{x}{a} = b$, $\frac{a}{x} = b$, pages 301–303

4. $3x = 0.27$, $x = 0.09$

5. $x = \frac{3}{16}$



6. a) $v = -\frac{5}{12}$



b) $x = \frac{4}{5}$ or 0.8



c) $a = -\frac{16}{15}$ d) $x = \frac{3}{2}$

7. a) $x = \frac{12}{5}$ b) $y = -\frac{3}{5}$ c) $n = \frac{7}{8}$ d) $w = \frac{7}{16}$

8. a) $x = -0.625$ b) $e = 1.65$

9. a) $h = 14.76$ b) $c = 3.2$

10. a) $a = -0.2$ b) $m = 0.75$

11. a) $n = 2.85$ b) $x = 0.55$

12. a) $d = 318.75$ km b) $t = 1.6$ h

13. $0.05n = 2.00$, $n = 40$

14. $s = 6.45$ cm

15. d is greater than zero because the value of $-\frac{5}{d}$ is negative. Therefore, d must be positive.

16. $d = 17.4$ cm

17. $n = 6$, hexagon

18. 214 students did not buy the yearbook.

19. A score of 25 would give a mark of 100%.

20. The Yukon Territory covers 4.8% of Canada.

21. Her net monthly income is \$2500.

22. The team scored 110 points together.

23. The sale price was \$999.96.

24. They expect to attract about 111 new volunteers.

25. The side length is 8.3 cm.

26. a) $x = \frac{3}{5}$ b) $z = 3.24$ c) $y = \frac{6}{5}$ d) $f = -0.495$

27. a) $t = -0.51$ b) $h = -0.78$

28. a) $x = -\frac{3}{8}$ b) $t = \frac{1}{3}$ c) $y = \frac{5}{4}$ d) $g = -\frac{4}{3}$

29. a) There are 54 coins in the jar.

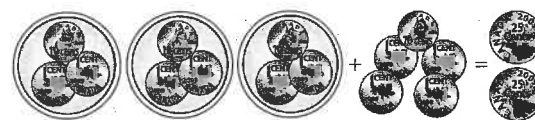
b) There are 19 dimes.

30. The cyclist's speed is 21 km/h.

8.2 Solving Equations: $ax + b = c$, $\frac{x}{a} + b = c$, pages 311–313

5. $x = 0.20$

6. $x = 0.12$



7. a) $y = 0.25$ b) $d = \frac{7}{8}$ c) $n = -3$ d) $r = \frac{1}{5}$

8. a) $h = \frac{5}{24}$ b) $x = -\frac{3}{16}$ c) $d = \frac{9}{8}$ d) $g = -\frac{12}{7}$

9. a) $x = -2.1$ b) $r = 6.984$

10. a) $n = -0.037$ b) $k = -1.512$

11. a) $v = -0.116$ b) $x = 3.2$

12. a) $d = 55.5$ b) $a = 14.3$

13. four toppings

14. 168 km

15. \$35

16. a) \$2206 b) \$7600

17. 11.6 m

18. 4.82 cm

19. 332.7 mm

20. 112 cm or 1.12 m, 138 cm or 1.38 m

21. 101 mm

22. 5 h

23. Sharifa. It will only take 7 weeks for her to save enough money.

24. 3.75 min

25. 108.2 million km

26. a) Example: $\frac{x}{2} + 1 = \frac{4}{3}$ b) Example: $\frac{x}{0.4} + 1 = -1$

27. Example: John is 2.5 years older than twice his brother's age. John is 12.5 years old. How old is his brother?

$2b + 2.5 = 12.5$, $b = 5$

John's brother is 5 years old.

28. a) $w = -\frac{14}{3}$ b) $x = -\frac{1}{9}$

29. a) $y = -1.14$ b) $s = 8.28$

30. a) $x = 0.5$ b) $n = \frac{16}{3}$ c) $h = -1.408$ d) $y = -2$

31. $x = -0.85$

32. 500 m

8.3 Solving Equations: $a(x + b) = c$, pages 319–321

5. $3(x + 0.05) = 0.60$, $x = 0.15$

6. a) $x = 2.3$ b) $c = 3.45$ c) $a = -5.7$ d) $r = 0.3$

7. a) $u = 11.36$ b) $m = -3.93$ c) $v = 1.68$ d) $x = 3.41$

8. a) $n = -\frac{5}{2}$ b) $x = \frac{19}{2}$ c) $w = -\frac{2}{9}$ d) $g = \frac{13}{4}$

9. a) $y = -\frac{1}{5}$ b) $q = -\frac{17}{2}$ c) $e = -\frac{13}{2}$ d) $p = \frac{15}{4}$