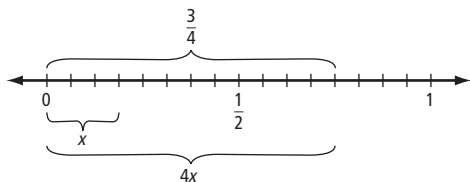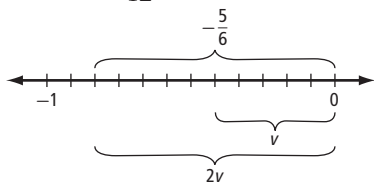# Chapter 8

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. $x = \dfrac{3}{16}$

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

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

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

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

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 $-\dfrac{5}{d}$ 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) $x = \dfrac{3}{5}$ **b)** $z = 3.24$ **c)** $y = \dfrac{6}{5}$ **d)** $f = -0.495$

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

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

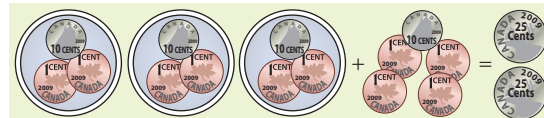**29. a)** There are 54 coins in the jar.
b) There are 19 dimes.
30. The cyclist's speed is 21 km/h.

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)** $d = \dfrac{7}{8}$ **c)** $n = -3$ **d)** $r = \dfrac{1}{5}$

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

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: $\dfrac{x}{2} + 1 = \dfrac{4}{3}$ **b)** Example: $\dfrac{x}{0.4} + 1 = -1$

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) $w = -\dfrac{14}{3}$ **b)** $x = -\dfrac{1}{9}$

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

30. a) $x = 0.5$ **b)** $n = \dfrac{16}{3}$ **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) $n = -\dfrac{5}{2}$ **b)** $x = \dfrac{19}{2}$ **c)** $w = -\dfrac{2}{9}$ **d)** $g = \dfrac{13}{4}$

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

10. a) $x = 3.4$ **b)** $k = -63.6$ **c)** $q = -2.27$
d) $a = -5.9$
11. a) $q = 1.1$ **b)** $y = 0.071$ **c)** $n = -2.18$ **d)** $p = 0$
12. $x = -1.7$
13. a) $3(x + 1.05) = 9.83$, $x = 2.2$
14. $x = 6.76$
15. 3.3 °C
16. $d = -0.45$
17. $2.99
18. $37.50
19. $6.40/skin
20. a) $h = 7.8$ cm **b)** $a = 1.3$ m
21. 15.6 cm
22. 15 years old
23. a) $x = -2.3$ **b)** $y = 4.9$ **c)** $f = 2.8$ **d)** $t = -8.98$
24. a) $d = -16.8$ **b)** $r = 3.5$ **c)** $g = 1.6$ **d)** $h = -18$
25. The longer side is 0.5 units and the shorter side
is 0.25 units.
26. -15
27. 1 h 27.6 min
28. a) $n = \dfrac{4}{x} + 3$ **b)** $n = \dfrac{4}{x} + 3$

c) Divide first, because it involves fewer steps.

8.4 Solving Equations: $ax = b + cx$, $ax + b = cx + d$, $a(bx + c) = d(ex + f)$, pages 326–329
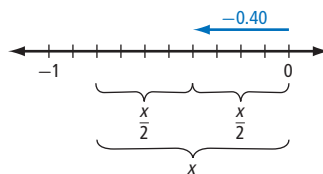
4. $3x + 0.15 = 2x + 0.30$, $x = 0.15$
5. $x = \$0.55$
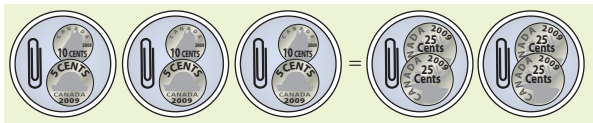
6. a) $x = 6.4$ **b)** $y = 3$ **c)** $a = -0.8$ **d)** $g = \dfrac{6}{7}$

7. a) $n = \dfrac{4}{3}$ **b)** $w = -2.2$ **c)** $p = 4.25$ **d)** $e = \dfrac{3}{10}$

e) $d = -18$

8. a) $k = 0.5$ **b)** $p = -21$ **c)** $u = 3$ **d)** $h = -\dfrac{5}{2}$

9. a) $r = -2.55$ **b)** $c = 0.4$ **c)** $k = 8$ **d)** $p = \dfrac{11}{3}$

10. a) $q = 0.22$ **b)** $x = -5$ **c)** $y = 0.75$ **d)** $x = \dfrac{5}{2}$

11. a) $s = -0.4$ **b)** $g = 7.8$ **c)** $x = 6$ **d)** $m = -2$
12. a) $c = -3.36$ **b)** $n = 3.38$ **c)** $x = 1.39$ **d)** $a = -0.17$
13. a) 19 nickels **b)** $1.90
14. 5 weeks
15. Rectangle A: 2.5 units by 3.1 units;
Rectangle B: 0.1 units by 5.5 units
16. a) $x = 1.4$ **b)** The perimeter of each triangle is
23.3 units.
17. 33 min
18. Each rectangle has an area of 13.68 square units.
19. a) 17.5 min **b)** 1.3125 km
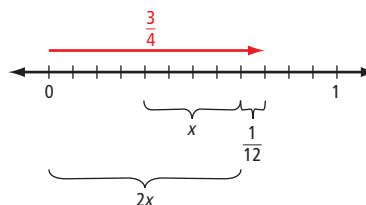**20.** $f = 180$ cm
21. 12 movies/year

22. The speed of the current is 7.07 km/h.
23. a) Yes. When the distributive property is applied to
both sides of the expression, the result is two identical
expressions. **b)** Yes. When the distributive property is
applied to both sides of the expression, the result is two
identical expressions.
24. Example: My dad always tells the same story about
how hard he worked when he first came to Canada. He
said he worked after school as a server in a restaurant
earning $x/h. One day, he worked 3.5 h and had
$1.2 in tips. Another day, he worked 4 h and had
$0.90 in tips. Both days, he earned the same amount of
money. How much was my dad getting per hour?
25. Example: One video store charges a $5 annual
membership fee and $4 per movie. Another store charges
no membership fee, but $5 per movie. How many movies
per year would you have to rent for the cost to be the
same at both stores? Let m represent the number of
movies. $4m + 5 = 5m$, $m = 5$ movies.
26. a) $x = 17.5$ **b)** $y = -30$ **c)** $d = 2.2$ **d)** $j = 1.5$
27. a) $a = 1.125$ **b)** $s = 9$ **c)** $q = -3$ **d)** $z = -1.25$
28. $k = \dfrac{10 - x}{3}$

29. $n = -1.2$
30. a) $x = \dfrac{1}{14}$ **b)** $y = -\dfrac{1}{3}$

Chapter 8 Review, pages 330–331

1. D, B, A, C, C
2. opposite operation
3. distributive property
4. $x = -0.8$

5. a) $d = -\dfrac{1}{10}$ **b)** $y = 8.04$ **c)** $h = -17.5$ **d)** $u = 1.9$
6. a) $w = -4.7$ **b)** $k = 9.0$
7. a) $m = 43.3$ g **b)** $v = 12.5$ cm³
8. 60 goals
9. $x = \dfrac{1}{3}$

10. a) She should have divided by -3. **b)** $g = 3$

11. a) $t = -14.56$ **b)** $x = 9.5$ **c)** $r = \dfrac{4}{3}$ **d)** $v = -\dfrac{20}{7}$

12. $34.95

13. 58.6 Earth days

14. a) $e = -6.7$ **b)** $r = 1.5$ **c)** $h = -21.1$ **d)** $q = \dfrac{7}{8}$

15. $m = -1.97$

16. $k = 3.225$ m

17. $21.75

18. a) $n = 15$ **b)** $f = 1.75$ **c)** $g = -1.6$ **d)** $h = -60$

e) $v = -\dfrac{11}{6}$

19. a) $a = 1.9$ **b)** $P = 25.2$ units

20. $w = 7.5$ cm