# Chapter 2.1

## Answers

### Practice and Problem-Solving Exercises

**10.** 4 **11.** 19 **12.** 18 **13.** −9
**14.** 11 **15.** 26 **16.** −20 **17.** 7.5
**18.** −13 **19.** 132 **20.** 42 **21.** 13.5
**22.** 56 **23.** 2 **24.** −9.6 **25.** −4
**26.** 8 **27.** −4 **28.** 29 **29.** 0.16
**30.** −24 **31.** 5 **32.** 3.5 **33.** $-\frac{1}{2}$
**34.** 84 **35.** 175 **36.** 91
**37.** −117 **38.** 28 **39.** 81 **40.** 65
**41.** −34 **42.** 27 **43.** 12 **44.** $-1\frac{3}{5}$
**45.** −25 **46.** $1\frac{3}{7}$ **47.** 81 **48.** −14
**49.** 24

**50.** $c$ = number of CDs already on rack; $c + 7 = 30$; 23

**51.** $p$ = city's population at start of three-year period; $p - 7525 = 581{,}600$; 589,125

### Practice and Problem-Solving Exercises (continued)

**52.** Answers may vary. Sample: Normally you would use subtraction. You could use addition by adding to each side of the equation the additive inverse of the term you would have subtracted.

**53.** $4500 **54.** 1300 pts
**55.** $-\frac{1}{21}$ **56.** $3\frac{2}{7}$
**57.** $7\frac{1}{3}$ **58.** $-6\frac{3}{4}$
**59.** $31\frac{1}{4}$ **60.** −6.5
**61.** $\frac{1}{3}$ **62.** −18
**63.** 0.8 **64.** −(
**65.** $2\frac{1}{2}$ **66.** 14
**67.** −25 **68.** 1.7
**69.** $-\frac{1}{2}$

**70.** **a.** $17p = 102$; 6
**b.** $102p = 17$; 0.17

**71.** Each side of the equatic be multiplied by 9 not $\frac{1}{9}$ $(9)(-36) = (9)\left(\frac{x}{9}\right)$, so $x$

**72.** 8.1 yr
**73.** 21 aces
**74.** Check students' work.
**75.** 2450 letters

# Chapter 2.2

## Practice and Problem-Solving Exercises

**11.** −12 **12.** 5 **13.** −1
**14.** −50 **15.** −2 **16.** 72
**17.** −27 **18.** −3 **19.** 126
**20.** 100 **21.** −3 **22.** −5.5
**23.** 16 boxes **24.** 3 bottles
**25.** $1150 **26.** 24 **27.** 29
**28.** 8 **29.** −2 **30.** 12 **31.** −8
**32.** −7 **33.** 8 **34.** −5 **35.** 6
**36.** −6 **37.** −15
**38.** −5 **39.** 2.7
**40.** $63.\overline{6}$ **41.** 5
**42.** $-10\frac{1}{2}$ **43.** −3.8
**44.** $-6\frac{1}{3}$ **45.** 0.449
**46.** 100

**47.** $15 - 9 = 9 - 3p - 9$ Subt. Prop. of Eq.
$6 = -3p$ Use subtraction to simplify.
$\frac{6}{-3} = \frac{-3p}{-3}$ Div. Prop of Eq.
$-2 = p$ Use division to simplify.

**48.** $4 - 5k - 4 = -16 - 4$ Sub. Prop. of Eq.
$-5k = -20$ Use subtraction to simplify.
$\frac{-5k}{-5} = \frac{-20}{-5}$ Div. Prop. of Eq.
$k = 4$ Use division to simplify.

**49.** $9 + \frac{c}{-5} - 9 = -5 - 9$ Sub. Prop. of Eq.
$\frac{c}{-5} = -14$ Use subtraction to simplify.
$\frac{c}{-5} \cdot -5 = -14 \cdot -5$ Mult. Prop. of Eq.
$c = 70$ Use multiplication to simplify.

**50.** $\frac{q}{-3} + 12 - 12 = 2 - 12$ Sub. Prop. of Eq.
$\frac{q}{-3} = -10$ Use subtraction to simplify.
$\frac{q}{-3} \cdot -3 = -10 \cdot -3$ Mult. Prop. of Eq.
$q = 30$ Use multiplication to simplify.

**51.** 4 should be added to each side; $2x - 4 + 4 = 8 + 4$, so $2x = 12$ and $x = 6$.

**52.** Negative; $x$ must be negative in order for $-3x + 5$ to equal 44.

**53. a.** 4
**b.** yes
**c.** Answers may vary. Sample: The method in part (a) is easier because it doesn't involve fractions.

**54.** 21
**55.** 10.5
**56.** 4112 times
**57.** Check students' work; 4.
**58.** 175 lb

# Chapter 2.3

## Answers

### Practice and Problem-Solving Exercises

**10.** 4
**11.** $2\frac{6}{7}$
**12.** 7
**13.** 6
**14.** 10
**15.** $5\frac{4}{7}$
**16.** 4
**17.** $-10$
**18.** 13
**19.** $3x + 6x + 20 = 92$; \$8 per h
**20.** $167t + 19t + 16 = 1132$; 6 tickets
**21.** 6
**22.** 3
**23.** 3.75 or $3\frac{3}{4}$
**24.** 2
**25.** $7\frac{3}{7}$
**26.** $-3.25$ or $-3\frac{1}{4}$
**27.** $\frac{1}{6}$
**28.** 2
**29.** 9.75 or $9\frac{3}{4}$
**30.** $-4$
**31.** $\frac{7}{25}$
**32.** $-2$
**33.** $2\frac{1}{3}$
**34.** 1
**35.** $56\frac{5}{8}$
**36.** $\frac{3}{8}$
**37.** $\frac{1}{5}$
**38.** $-2\frac{2}{3}$
**39.** 3.5
**40.** 9
**41.** 5
**42.** 6
**43.** 4.27
**44.** 28
**45.** $43\frac{3}{7}$
**46.** $28\frac{1}{2}$
**47.** $3\frac{5}{16}$
**48.** 28
**49.** 1.5 or $1\frac{1}{2}$
**50.** $-5\frac{11}{12}$
**51.** 2
**52.** 9
**53.** $6\frac{2}{3}$
**54.** \$3.20
**55.** \$15
**56.** The 8 should be distributed to all terms; $8\left(\frac{3x}{8} - 1\right) = 8\left(\frac{5}{8}\right)$ gives $3x - 8 = 5$ and $3x = 13$ so $x = 4\frac{1}{3}$.
**57.** Answers may vary. Sample: Combine the like terms on the left side of the equation.
**58.** Answers may vary. Sample: Distribute $-\frac{1}{2}$ on the left side of the equation or multiply both sides of the equation by the reciprocal of $-\frac{1}{2}$.
**59.** 3 games
**60.** 60 mi
**61.** 25
**62.** 26
**63.** 20
**64.** \$12.40
**65.** 4 weeks

# chapter 2.4

## Practice and Exercises

**10.** 4
**11.** −9
**12.** 2
**13.** 6
**14.** 2
**15.** −4
**16.** −2
**17.** $-1\frac{3}{4}$
**18.** no solution

## Answers

### Practice and Problem-Solving Exercises (continued)

**19.** 22 ft
**20.** 40 haircuts
**21.** 25
**22.** 7
**23.** −37
**24.** 1
**25.** 18
**26.** $1\frac{1}{6}$
**27.** no solution
**28.** identity
**29.** no solution
**30.** no solution
**31.** identity
**32.** Identity
**33.** $\frac{2}{63}$
**34.** no solution
**35.** −19
**36.** $\frac{13}{33}$
**37.** no solution
**38.** 0
**39.** −9
**40.** identity
**41. a.** $\frac{d}{60}$
**b.** $\frac{d}{40}$
**c.** $\frac{d}{60} + 1 = \frac{d}{40}$; 120 mi; 48 mi/h
**42.** 60 potatoes
**43.** Subtraction should be used to isolate the variable, not division by the variable. $2x = 6x$, so $0 = 4x$, and $x = 0$.
**44.** 6 days
**45.** 2 months
**46.** $AB = 16$, $BC = 15$, $AC = 12$; $PQ = 12$, $QR = 12$, $PR = 19$
**47.** about 857 bottles
**48. a.** no
**b.** Between −1 and −3; answers may vary. Sample: $7(x + 1)$ is less than $3(x - 1)$ when $x = -3$, but is greater than $3(x - 1)$ when $x = -1$.
**c.** all values −3 or less
**56.** 0, 1, 2
**57.** B
**58.** G
**59.** A
**60.** 5
**61.** −6
**62.** 1
**63.** 0.9 m
**64.** 22
**65.** 9
**66.** 11.2

# chapter 2.5

## Practice and Problem-Solving Exercises

**11.** $y = -2x + 5$; 7; 5; $-1$

**12.** $y = -2x + 4$; 8; 2; $-2$

**13.** $y = \frac{3x - 9}{5}$; $-\frac{12}{5}$; $-\frac{9}{5}$; $-\frac{6}{5}$

**14.** $y = \frac{4x + 7}{3}$; $\frac{23}{3}$; 9; $\frac{31}{3}$

**15.** $y = -\frac{5x - 4}{4}$; $-\frac{1}{4}$; $-\frac{3}{2}$; $-\frac{11}{4}$

**16.** $y = \frac{-7x + 4}{2}$; $-\frac{31}{2}$; $-33$; $-\frac{101}{2}$

**17.** $y = \frac{x + 4}{4}$; $\frac{1}{2}$; 2; $\frac{5}{2}$

**18.** $y = -\frac{6x - 7}{4}$; $4\frac{3}{4}$; $3\frac{1}{4}$; $1\frac{3}{4}$

**19.** $x = \frac{p}{m + n}$

**20.** $x = \frac{c}{a - 1}$

**21.** $x = \frac{t}{r + s}$

**22.** $x = by + v$

**23.** $x = \frac{S - C}{C}$

**24.** $x = \frac{ay}{b}$

**25.** $x = \frac{A - C}{Bt}$

**26.** $x = \frac{4b}{3}$

**27.** $x = 2y - 4$

**28.** 3.5 m

**29.** 4.5 in.

**30.** 16 ft

**31.** 7 cm

**32.** 75 yd

**33.** 0.4 h

**34.** $h = an$; 87 hits

**35.** $h = \frac{n}{7\ell}$; 8 ft

**36.** $x = \frac{2m - 4}{1 + n}$

**37.** $x = \frac{ay}{b} + a$

**38.** $y = \frac{-ax + 14}{2x}$

**39.** $h = \frac{3V}{\pi r^2}$

**40.** $g = \frac{2A}{h} - f$

**41.** $a = 2b - x$

**42.** 9 sides

**43.** −108.4°F

**44. a.** $m = \frac{2E}{v^2}$

**b.** 50 kg

**45.** 3 was added to the left side of t equation instead of subtracted; $2m - 3 = -6n$, $\frac{2m - 3}{-6} = n$.

**46.** $h = \frac{V}{\pi r^2}$; 10 cm

**47.** 5 $cm^3$

**49. a.** $A = 2s^2 + 4sh$

**b.** $h = \frac{A - 2s^2}{4s}$; 14 cm

**c.** $A = 6s^2$

**50. a.** 5.7

**b.** $b = 2m - a$

**c.** −1.9

**51.** 6

**52.** 6.5

**53.** 92 chirps

**54.** 5

**55.** 3

**56.** −4

**57.** 3

**58.** identity

**59.** no solution

**60.** 147

**61.** −40

**62.** 567

**63.** 100

**64.** 3

**65.** $\frac{8}{5}$

**66.** $\frac{7}{45}$

## Practice and Problem-Solving Exercises

chapter 2.6

**9.** Olga
**10.** Bellingham, WA
**11.** 189 ft
**12.** 7 d
**13.** 40 oz
**14.** 2 m
**15.** 240 s
**16.** 1.5 L
**17.** about 8.2 m
**18.** about 11 lb
**19.** 7900 cents
**20.** about 2.8 L
**21.** about 35 in.
**22.** about 61 cm
**23.** 1.875 gal/h
**24.** $.09 a day
**25.** 87
**26.** about 4.8
**27.** 150
**28.** $\frac{1}{120}$
**29.** 18
**30.** about 65.8
**31.** 0.5 mi
**32.** 63 in.
**33.** 5 oz
**34.** $317.55 per year
**35.** recipe B
**36.** The numbers are correct but the units are reversed in the conversion factor; $9 \text{ yd} \cdot \frac{3 \text{ ft}}{1 \text{ yd}} = 27 \text{ ft}$.
**37.** Miles; kilometers; kilometers cancel out and miles are left.
**38. a.** greater than
**b.** less than
**c.** less than
**39.** 1580.82 INR; 19.98 GBP
**40.** 48 km
**41.** Answers may vary. Sample: Estimating
**42.** No; exchange rates vary from day to day.
**43.** 2255.6 mm
**44. a.** 6.45 $cm^2$
**b.** about 20 $in.^2$
**45.** B
**46.** I
**47.** C
**48.** 5 cm
**49.** 15 in.
**50.** 5
**51.** 6
**52.** 0.5
**53.** 3
**54.** 27
**55.** $\frac{1}{112}$
**56.** $20m$
**57.** $\frac{2y}{7}$

# chapter 2.7

## Practice and Problem-Solving Exercises

**10.** 6.4 **11.** −19.5 **12.** 3.75
**13.** 4.2 **14.** 2.25 **15.** 112.5
**16.** 5 **17.** $16\frac{2}{3}$ **18.** 4.875
**19.** 10 **20.** 80 **21.** 14
**22.** −10.8 **23.** $26\frac{2}{3}$ **24.** −16.5
**25.** −15 **26.** 8 **27.** 4.75
**28.** 11 **29.** 11 **30.** 13.2
**31.** $-6\frac{2}{3}$ **32.** 23 **33.** −5
**34.** 2.5 h **35.** 8 dozen **36.** 17.5 lb
**37.** about 14 people
**38.** about 5 m
**39.** $\frac{\$.07}{1 \text{ kw-h}} = \frac{\$143.32}{x \text{ kw-h}}$; 2047.4 kw-h
**40.** 40 min
**41.** at the same time as you
**42.** 3.5
**43.** 1.8
**44.** 2.1
**45.** 2.7
**46.** $4\frac{2}{3}$
**47.** 4.2
**48.** −3
**49.** $-\frac{2}{3}$
**50.** −17
**51.** 3 was not fully distributed when multiplying 3 and $x + 3$; $16 = 3x + 9$, $7 = 3x$, $x = \frac{7}{3}$.
**52.** C
**53.** Check students' work.
**54.** 53
**55.** $-\frac{4}{3}$
**56.** 3
**57.** $-\frac{5}{7}$
**58.** 1400 tissues
**59.** 22 h
**60.** C
**61.** H
**62.** B
**63.** 1.5
**64.** 7
**65.** 90
**66.** 190
**67.** no solution
**68.** $\frac{1}{5}$
**69.** identity
**70.** $2\frac{4}{5}$ or 2.8
**71.** $2\frac{2}{15}$ or $2.1\overline{3}$
**72.** $6\frac{2}{3}$ or $6.\overline{6}$
**73.** $\frac{3}{5}$ or 0.6

chapter 2.8

## Practice and Problem-Solving Exercises

**6.** $\angle A \cong \angle D$, $\angle B \cong \angle E$, $\angle C \cong \angle F$, $\frac{AB}{DE} = \frac{AC}{DF} = \frac{BC}{EF}$

**7.** $\angle F \cong \angle K$, $\angle G \cong \angle L$, $\angle H \cong \angle M$, $\angle I \cong \angle N$, $\frac{FG}{KL} = \frac{GH}{LM} = \frac{HI}{MN} = \frac{FI}{KN}$

**8.** 12

**9.** 40

**10.** 52.5

**11.** 100

**12.** about 48 yd

**13.** 37.5 km

**14.** 3 km

**15.** 225 km

**16.** 69 km

**17.** 67.5 ft

**18.** 1 in. : 70

**19.** $6\frac{1}{2}$ ft × $2\frac{1}{2}$ ft

**20.** 20 ft × 10 ft

**21.** no

**22.** $1\frac{1}{6}$ ft or 1 ft 2 in.

**23. a.** The student us

**b.** $\frac{BC}{AJ} = \frac{GH}{FN}$

**24.** 100 times

**25.** 39,304 times

**26.** B

**27.** Yes; all squares have sides that are in proportion (the same length), and the measures of corresponding ∠s are equal (90°).

**28.** Answers may vary. Sample: The ratio of the lengths to the widths will not be in proportion.

**29.** Answers may vary. Sample: No; the finished table could have been a parallelogram with different angles than the parallelogram in the sketch. The angle measures were not given.

**30. a.** 1 : 4.6

**b.** 1 : 3.46

**31.** C

**32.** F

**33.** B

**34.** I

**35.** 34

**36.** 4.5

**37.** −8

**38.** $-\frac{3}{5}$

**39.** 1.5

**40.** 8

**41.** 0.4

**42.** 0.25

**43.** 2.9

## Practice and Problem-Solving Exercises

**9.** 20%
**10.** 500%
**11.** 62.5%
**12.** 125%
**13.** $41\frac{2}{3}\%$
**14.** 100%
**15.** 36
**16.** 94.5
**17.** 13
**18.** 94.5
**19.** 16
**20.** 0.01
**21.** $52
**22.** $6.30
**23.** 400
**24.** 25
**25.** 22.5
**26.** 125
**27.** $22\frac{2}{3}$
**28.** 100
**29.** $108
**30.** $33
**31.** part; 5.04
**32.** percent; $266\frac{2}{3}$
**33.** part; 142.5
**34.** part; 112
**35.** percent; $1333\frac{1}{3}$
**36.** base; 24
**37.** 66,000 $mi^2$
**38.** C
**39.** 16
**40.** 60
**41.** 75
**42.** B
**43.** B
**44.** A
**45.** 121%; it costs more to make a pen than the penny is worth.
**46.** No; it would cost more to produce the item than you would make from selling it, so you would never make profit.
**47.** The values for $a$ and $b$ are reversed. $\frac{3}{1.5} = \frac{p}{100}$, $1.5p = 300$, $p = 200\%$
**48.** Answers may vary. Sample: Determine the amount of water that was originally in the bottle. Then determine the amount of water consumed. Find what percent of the original amount of water was consumed.
**49.** $181
**50.** about 109%
**51.** $29\frac{1}{6}\%$
**52.** $120
**53.** 25 students
**54.** C
**55.** F
**56.** B
**57.** 14.4 cm
**58.** 18 cans
**59.** $c = 1.75 + 2.4\left(m - \frac{1}{8}\right)$; $2\frac{5}{8}$
**60.** 1250%
**61.** 0.6
**62.** 175%

chapter 2.9

chapter 2.10

## Practice and Problem-Solving Exercises

**7.** increase; 50%
**8.** decrease; 33%
**9.** decrease; 7%
**10.** increase; 27%
**11.** decrease; 4%
**12.** decrease; 2%
**13.** increase; 54%
**14.** increase; 10%
**15.** increase; 27%
**16.** about 9%
**17.** about 55%
**18.** about 23%
**19.** about 13%
**20.** 161.5 lb; 162.5 lb
**21.** 1.05 kg; 1.15 kg
**22.** 0.35 mm; 0.45 m
**23.** about 28%
**24.** about 5%
**25.** 175% increase
**26.** 24% increase
**27.** 42% decrease
**28.** 78% increase
**29.** 39% increase
**30.** 76% decrease

**31.** 48.75 $m^2$; 63.75 $m^2$
**32.** 253.75 $in.^2$; 286.75 $in.^2$
**33.** 505.25 $ft^2$; 551.25 $ft^2$
**34.** Answers may vary. Sample: They are both the ratio of the amount of a change to an original or actual amount.
**35.** Check students' work.
**36.** 7280 fans
**37.** The original amount is 12, not 18; $\frac{18 - 12}{12} = \frac{6}{12} = 0.5 = 50\%$.
**38.** about 4%
**39.** $12.63
**40.** 51.25%
**41. a.** 21%
**b.** 21%
**c.** 21%; sample: the new length is 1.1 times as great as the original length. $1.1^2 = 1.21$ or 121%, which shows a 21% increase over the original amount of 100%.
**42.** B
**43.** I
**44.** D
**45.** $66\frac{2}{3}\%$
**46.** 64.75
**47.** 21
**48–51.**


$-3, -2.8, \frac{1}{2}, 2$