p. 163 (#5, 6) and p. 167 (#7-10)

5. 7.5 degrees per hour

6. 61 miles per hour

7. $72

8. $28

9. 870 MB

10. 57 mi

pp. 167-169 (#13-15, 20-23, 29)

13. $\frac{7}{3}$

14. $\frac{17}{3}$

15. $\frac{4}{3}$

20. \$0.80 per can

21. 54 words per min

22. 8.7 m per h

23. 4.5 servings per package

29. no; Although the relative number of boys and girls are the same, the two ratios are inverses.

p. 171 (#4, 5) and p. 174 (#15-20)

4. (Will go over in class)
5. (Will go over in class)

15. yes
16. no
17. no
18. no
19. yes
20. no

pp. 174-175 (#8, 9, 21, 23-25, 31)

8. no

9. yes

21. yes; Both can do 45 sit-ups per minute.

23. yes

24. no

25. yes

31. no; The ratios are not equivalent; $\frac{13}{19} \neq \frac{14}{20} \neq \frac{15}{21}$ etc.

pp. 178-179 (#4-5, Practice)

4. (Will go over in class)
5. (Will go over in class)

4. $\frac{x}{50} = \frac{40}{100}$

5. $\frac{x}{50} = \frac{78}{100}$

6. $\frac{x}{80} = \frac{80}{100}$

7. $\frac{x}{150} = \frac{96}{100}$

pp. 182-183 (#5, 9, 11, 12, 19-21, 23-25)

5. $\frac{x}{50} = \frac{78}{100}$

9. $\frac{n \text{ winners}}{85 \text{ entries}} = \frac{34 \text{ winners}}{170 \text{ entries}}$

11. $\frac{100 \text{ meters}}{x \text{ seconds}} = \frac{200 \text{ meters}}{22.4 \text{ seconds}}$

12. The proportion cannot be written using diagonals of the table. $\frac{2.08}{8} = \frac{d}{16}$

19. $c = 24$

20. $b = 20$

21. $g = 14$

23. $\frac{1}{200} = \frac{19.5}{x}$; Dimensions for the model are in the numerators and the corresponding dimensions for the actual space shuttle are in the denominators.

24. no; The solution of that equation is $x = 1.5$, but using mental math, you can see that the solution of the proportion is $x = 24$.

25. See *Taking Math Deeper*.

p. 185 (#1-13 odd, 14, 16, 17)

1. $\frac{3}{2}$

3. \$0.99 per song

5. yes

7. yes

9. yes

11. no

13. *Sample answer:*
$\frac{g \text{ games}}{4 \text{ wins}} = \frac{6 \text{ games}}{3 \text{ wins}}$

14. $\frac{1}{3}$ MB per second

16. no; Your rate is 5 minutes per level and your friend's rate is 4 minutes per level.

17. $\frac{150 \text{ minutes}}{3 \text{ classes}} = \frac{x \text{ minutes}}{5 \text{ classes}}$;
250 minutes

p. 187 (#3, 4) and p. 190 (#10-13)

3. (Will go over in class)
4. (Will go over in class)

10. $a = 45$

11. $k = 5.6$

12. $v = 10.5$

13. $n = 10$

pp. 190-191 (#7, 9, 17, 21, 22, 24-27, 31)

7. $n = 15$

9. $y = 7\frac{1}{3}$

17. $m = 20$

21. $k = 5.4$

22. They did not perform the cross multiplication properly.

$$\frac{m}{8} = \frac{15}{24}$$

$$m \cdot 24 = 8 \cdot 15$$

$$m = 5$$

24. \$35

25. $x = 1.5$

26. $d = 12$

27. $k = 4$

31. true; Both cross products give the equation $3a = 2b$.

p. 193 (#3, 4)

3. (Will go over in class)
4. (Will go over in class)

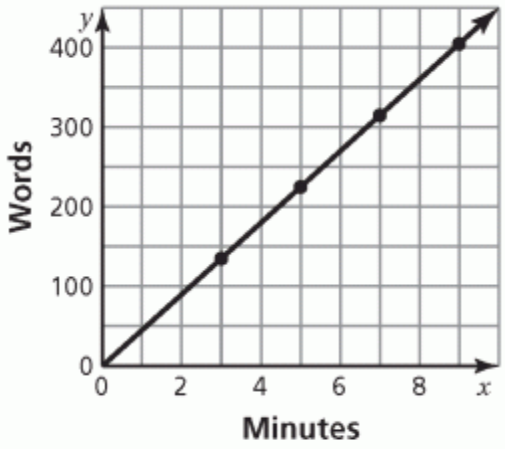
pp. 196-197 (#7-10, 12, 15, 19)

7. 1

8. $\frac{3}{4}$

9. $\frac{4}{5}$

10.

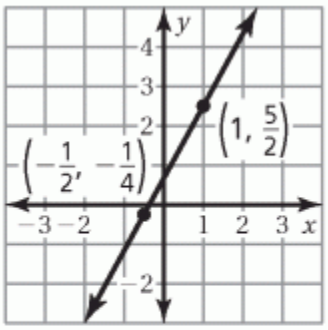


slope $= 45$; 45 words per minute

12. The change in y should be in the numerator. The change in x should be in the denominator.

Slope $= \frac{5}{4}$

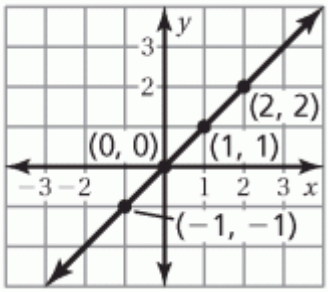
15.



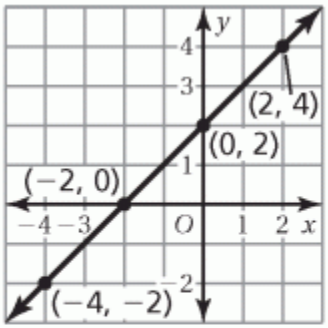
slope $= \frac{11}{6}$

19. $y = 6$

pp. 202-203 (#4-9, 18)

4. 

yes; All the points lie on a line and the line passes through the origin.

5. 

no; The line does not pass through the origin.

6. yes; The line passes through the origin; $k = 2$

7. no; The line does not pass through the origin.

8. no; The line does not pass through the origin.

9. yes; The line passes through the origin; $k = \frac{2}{3}$

18. The line does not pass through the origin, so x and y do not show direct variation.

pp. 202-203 (#10-17, 19, 22, 29)

10. no; The equation cannot be written as $y = kx$.

11. yes; The equation can be written as $y = kx$; $k = \frac{5}{2}$

12. no; The equation cannot be written as $y = kx$.

13. no; The equation cannot be written as $y = kx$.

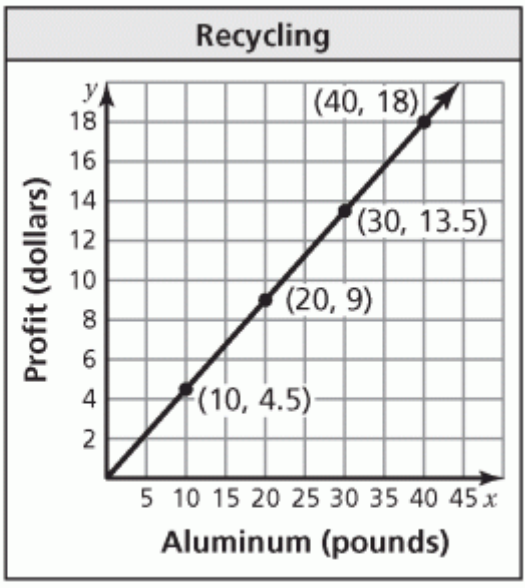
14. yes; The equation can be written as $y = kx$; $k = 1$

15. yes; The equation can be written as $y = kx$; $k = \frac{1}{2}$

16. no; The equation cannot be written as $y = kx$.

17. no; The equation cannot be written as $y = kx$.

19.



yes; $y = 0.45x$

22. $k = \frac{9}{8}$; $y = \frac{9}{8}x$

29. Every graph of direct variation is a line; however, not all lines show direct variation because the line must pass through the origin.

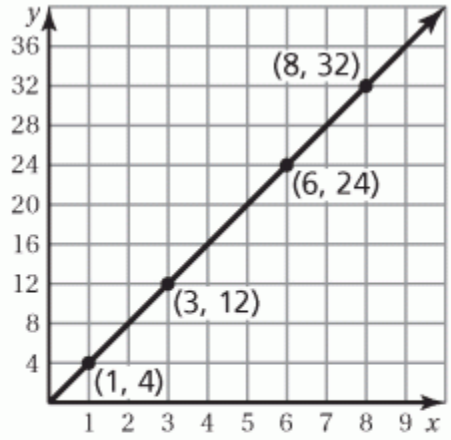
pp. 205-207 (#2, 3, 5, 6, 8, 10, 13, 14, 16, 17, 20, 21)

2. 2.4 revolutions per second

3. 120 calories per serving

5. yes

6. no

8. 

x and y are in a proportional relationship.

10. *Sample answer:*

$$\frac{15 \text{ songs}}{2.5 \text{ hours}} = \frac{18 \text{ songs}}{h \text{ hours}}$$

13. $w = 15$

14. $s = 1$

16. slope $= \frac{2}{3}$

17. slope $= 2$

20. yes; The equation can be written as $y = kx$.

21. no; The equation cannot be written as $y = kx$.

pp. 230-231 (#5, 6, 9, 16-19, 22, 24-26)

5. 20

6. 37.5%

9. about 37.5%

16. $\frac{a}{90} = \frac{110}{100}; a = 99$

17. $\frac{a}{40} = \frac{0.4}{100}; a = 0.16$

18. $\frac{72}{45} = \frac{p}{100}; p = 160$

19. 34 represents the part, not the whole.

$$\frac{a}{w} = \frac{p}{100}$$

$$\frac{34}{w} = \frac{40}{100}$$

$$w = 85$$

22. $\frac{0.5}{20} = \frac{p}{100}; p = 2.5$

24. $\frac{\frac{3}{4}}{w} = \frac{60}{100}; w = 1\frac{1}{4}$

25. $\frac{a}{\frac{7}{8}} = \frac{25}{100}; a = \frac{7}{32}$

26. 4 left

pp. 236-237 (#7-9, 13, 14, 17, 18, 21, 27, 28)

7. 84

8. about 38.5%

9. 64

13. $a = 0.008 \cdot 150$; 1.2

14. $29 = p \cdot 20$; 145%

17. $102 = 1.2 \cdot w$; 85

18. The percent was not converted to a decimal or fraction.

$$\begin{aligned} a &= p \cdot w \\ &= 0.35 \cdot 20 \\ &= 7 \end{aligned}$$

21. \$5400

27. If the percent is less than 100%, the percent of a number is less than the number; 50% of 80 is 40; If the percent is equal to 100%, the percent of a number is equal to the number; 100% of 80 is 80; If the percent is greater than 100%, the percent of a number is greater than the number; 150% of 80 is 120.

28. **a.** 80 students

b. 30 students

pp. 244-245 (#4, 5, 8, 11, 12, 14, 16, 20, 22)

4. 10 m

5. 24 L

8. increase; 200%

11. increase; 225%

12. increase; 140%

14. increase; 176.3%

16. The denominator should be 18, which is the original amount.

$$\frac{26 - 18}{18} \approx 0.44 = 44\%$$

20. increase; 100%

22. increase; 133.3%

pp. 244-245 (#6, 7, 9, 10, 13, 15, 21, 23, 24, 29)

6. 37 points

7. 17 penalties

9. decrease; 66.7%

10. decrease; 30%

13. decrease; 12.5%

15. decrease; 37.5%

21. decrease; 25%

23. decrease; 70%

24. Increasing 20 to 40 is the same as increasing 20 by 20. So, it is a 100% increase. Decreasing 40 to 20 is the same as decreasing 40 by one-half of 40. So, it is a 50% decrease.

29. less than; *Sample answer:* Let x represent the number. A 10% increase is equal to $x + 0.1x$, or $1.1x$. A 10% decrease of this new number is equal to $1.1x - 0.1(1.1x)$, or $0.99x$. Because $0.99x < x$, the result is less than the original number.

p. 239 (11-16), p. 258 (1, 2)

11. $\frac{6}{15} = \frac{p}{100}; p = 40$

12. $\frac{35}{25} = \frac{p}{100}; p = 140$

13. $\frac{a}{50} = \frac{40}{100}; a = 20$

14. $\frac{5}{w} = \frac{0.5}{100}; w = 1000$

15. $a = 0.28 \cdot 75; 21$

16. $42 = 0.21 \cdot w; 200$

1. increase; 200%
2. decrease; 30%

pp. 250-251 (#5, 13, 15, 18, 20, 22, 24a-b)

5. $35.70

13. $172.40

15. 20%

18. $128

20. no; Only the amount of markup should be in the numerator, $\frac{105 - 60}{60} = 0.75$. So, the percent of markup is 75%.

22. **a.** Store C

b. at least 11.82%

pp. 256-257 (#7-10, 12, 13, 16, 18, 19, 21, 35)

7. **a.** \$292.50 **b.** \$2092.50

8. **a.** \$336 **b.** \$1036

9. **a.** \$308.20 **b.** \$1983.20

10. **a.** \$44.40 **b.** \$969.40

12. They did not convert 18 months to years.

$$I = 500(0.06)\left(\frac{18}{12}\right)$$
$$= \$45$$

13. 3%

16. 12.05%

18. 8 yr

19. 1.5 yr

21. \$1440

35. 12.5 yr; Substitute \$2000 for P and I, 0.08 for r, and solve for t.

pp. 260-263 (#15-18, 21-23, 27, 28, 30, 31, 33, 34, 36)

15. $\frac{18}{60} = \frac{p}{100}; p = 30$

16. $\frac{40}{32} = \frac{p}{100}; p = 125$

17. $\frac{a}{70} = \frac{70}{100}; a = 49$

18. $\frac{\frac{3}{4}}{w} = \frac{75}{100}; w = 1$

21. $60.8 = p \cdot 32$; 190%

22. $91 = 1.3 \cdot w$; 70

23. $10.2 = 0.85 \cdot w$; 12

28. decrease; 56.7%

30. \$42.50

31. \$93.75

33. **a.** \$280

b. \$2280

34. 1.7%

36. 3 years