Name _____ Date _____

LESSON 6.2

Practice A

For use with pages 380–386

Copy and complete the statement.

1. If $\frac{7}{10} = \frac{x}{y}$, then $\frac{10}{7} = \frac{?}{?}$.

2. If $\frac{6}{x} = \frac{24}{y}$, then $\frac{6}{24} = \frac{?}{?}$.

3. If $\frac{3}{x} = \frac{9}{y}$, then $\frac{3 + x}{x} = \frac{?}{?}$.

4. If $\frac{x}{y} = \frac{5}{11}$, then $\frac{x + y}{y} = \frac{?}{?}$.

Decide whether the statement is *true* or *false*.

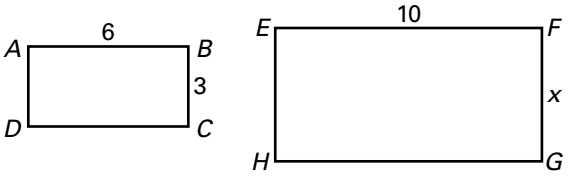
5. If $\frac{x}{y} = \frac{s}{t}$, then $\frac{y}{x} = \frac{t}{s}$.

6. If $\frac{x}{y} = \frac{s}{t}$, then $\frac{x}{s} = \frac{t}{y}$.

7. If $\frac{x}{4} = \frac{6}{8}$, then $\frac{x}{6} = \frac{4}{8}$.

8. If $\frac{x}{y} = \frac{5}{8}$, then $\frac{x + y}{y} = \frac{13}{8}$.

In Exercises 9–12, use the diagram, where $\frac{AB}{EF} = \frac{BC}{FG}$.



9. Substitute values from the figure into the given proportion.

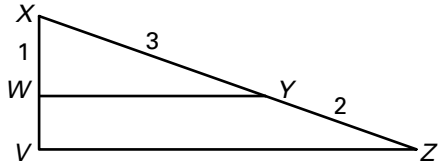
10. Use the Reciprocal Property to rewrite the proportion in Exercise 9.

11. Interchange the means of the proportion in Exercise 9 to write a true proportion.

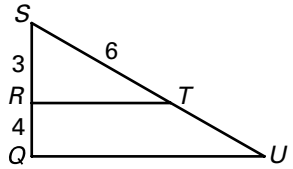
12. Add the denominators to the numerators of the proportion in Exercise 9 to write a true proportion.

Use the diagram and the given information to find the unknown length.

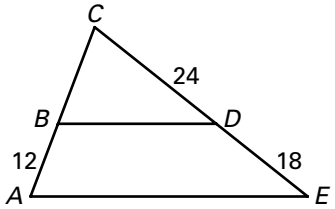
13. Given $\frac{XW}{WV} = \frac{XY}{YZ}$, find WV.



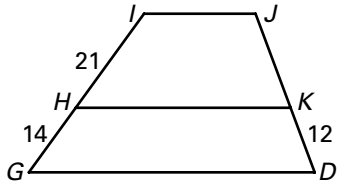
14. Given $\frac{SR}{RQ} = \frac{ST}{TU}$, find TU.



15. Given $\frac{BC}{AB} = \frac{CD}{DE}$, find BC.



16. Given $\frac{HI}{GH} = \frac{JK}{KD}$, find JD.



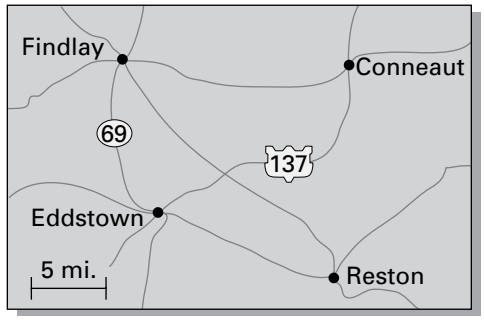
Name _____ Date _____

LESSON 6.2

Practice A *continued*

For use with pages 380–386

The scale of the map is 1 centimeter : 5 miles. Use a ruler to approximate the actual distance between the two towns.



17. Findlay and Conneaut

18. Findlay and Reston

19. Eddstown and Reston

20. Eddstown and Conneaut

The distance between two locations on a map is given along with the actual distance between the locations. Find the scale of the map.

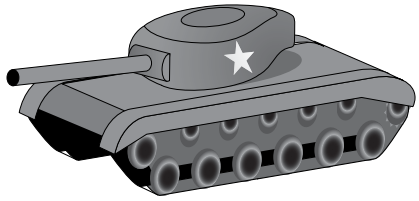
21. Map distance: 6 inches; Actual distance: 48 miles

22. Map distance: 2 centimeters; Actual distance: 8 miles

23. Map distance: 16 inches; Actual distance: 800 feet

24. Map distance: 3 inches; Actual distance: 240 kilometers

25. **Sherman Tank** A model of a Sherman Tank has a scale of 1 : 16.

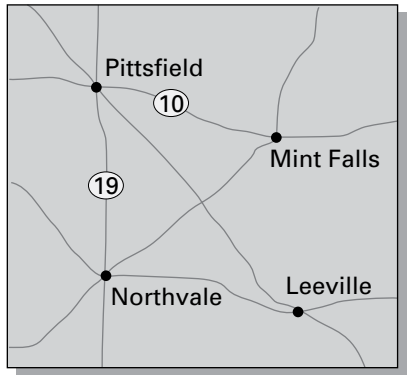


a. The length of the actual tank is 584 centimeters. What is the length of the model?

b. The width of the model is 16.375 centimeters. What is the width of the actual tank?

c. The actual tank stands 9 feet tall. What is the height of the model in inches?

26. **Estimating Distance** The actual distance between Pittsfield and Leeville as shown on the map is 24 miles.



a. Use a ruler to determine the scale of the map in terms of centimeters to miles.

b. Use a ruler to estimate the actual distance between Pittsfield and Northvale.

Lesson 6.1

Practice Level A

1. $\frac{1}{2}$ **2.** $\frac{1}{12}$ **3.** $\frac{2}{5}$ **4.** 4 : 1 **5.** 10 : 9 **6.** 8 : 25

7. $\frac{2\text{ cm}}{4\text{ cm}} = \frac{1}{2}$ **8.** $\frac{18\text{ in.}}{2\text{ ft}} = \frac{3}{4}$ **9.** $\frac{1}{3}$ **10.** $\frac{2}{3}$ **11.** $\frac{7}{2}$

12. $\frac{4}{1}$ **13.** $\ell = 15$ in., $w = 10$ in.

14. $\ell = 200$ ft, $w = 40$ ft **15.** $\ell = 16$ cm, $w = 2$ cm **16.** 60°, 60°, 60° **17.** 45°, 45°, 90°

18. 40°, 60°, 80° **19.** $x = 4$ **20.** $y = 9$

21. $z = 5$ **22.** $a = 24$ **23.** $b = 24$ **24.** $c = 54$

25. $x = 7$ **26.** $x = 8$ **27.** $x = 18$ **28.** 2 **29.** 3

30. 6 **31.** 10 **32.** $2\sqrt{6}$ **33.** $3\sqrt{5}$ **34.** $x = 15$

35. $a = 3$ **36.** $d = 10$ **37.** 5 : 12

38. $\ell = 147$ ft, $w = 49$ ft **39.** 625

40. 3234, 4312, 5390 **41.** 511 : 500

42. a. 14.625 in. **b.** about 23.1 in. **c.** 4 : 3

Practice Level B

1. 3 : 4 **2.** $\frac{4}{1}$ **3.** $\frac{3}{7}$ **4.** $\frac{5}{12}$ **5.** 6 : 5 **6.** $\frac{7}{8}$

7. $\frac{4\text{ cm}}{12\text{ cm}}; \frac{1}{3}$ **8.** $\frac{6\text{ in.}}{10\text{ in.}}; \frac{3}{5}$ **9.** $\frac{12\text{ in.}}{18\text{ in.}}; \frac{2}{3}$ **10.** $\frac{1}{2}$

11. $\frac{4}{1}$ **12.** $\frac{1}{5}$ **13.** $\frac{5}{7}$ **14.** 24 in., 4 in.

15. 35 cm, 15 cm **16.** 10°, 70°, 100°

17. 50°, 60°, 70° **18.** 35°, 70°, 75° **19.** 12

20. 32 **21.** 7 **22.** 9 **23.** 7 **24.** 3 **25.** 4

26. $3\sqrt{3}$ **27.** $7\sqrt{2}$ **28.** $8\sqrt{2}$ **29.** $2\sqrt{30}$

30. $3\sqrt{13}$ **31.** $\frac{5}{1}$ **32.** $\frac{5}{6}$ **33.** $\frac{1}{1}$ **34.** $\pm 4\sqrt{3}$

35. 4 **36.** ± 6 **37.** 9 **38.** 3 **39.** 4 **40.** 2160 ft^2

41. 179.6 in. **42.** 750 ft

Practice Level C

1. 1 : 64 **2.** 1 : 8 **3.** 1 : 7,884,000 **4.** 7 : 2200

5. 20 : 19 **6.** 3 : 5 **7.** 19 : 24 **8.** 5 : 4 **9.** 5 : 7

10. 27 : 20 **11.** 3 : 4 **12.** $\ell = 42$ cm, $w = 24$ cm

13. $\ell = 77$ ft, $w = 63$ ft **14.** $\ell = 119$ yd, $w = 91$ yd **15.** 30°, 75°, 75° **16.** 27°, 63°, 90°

17. 28°, 64°, 88° **18.** $x = 28$ **19.** $a = 15$

20. $y = 26$ **21.** $z = 3$ **22.** $b = 10$ **23.** $s = \pm 12$

24. $d = 5$ **25.** $x = 14$ **26.** $x = 16$ **27.** $y = 39$ m

28. $z = 12$ **29.** $b = 70$, $c = 30$ **30.** 12 **31.** 14

32. $4\sqrt{3}$ **33.** $6\sqrt{3}$ **34.** $15\sqrt{3}$ **35.** 24

36. $\ell = 24$ ft, $w = 8$ ft **37.** $\ell = 21$ yd, $w = 14$ yd

38. $a = 4$ **39.** $a = -1$ **40.** If the width of the larger rectangle is the same as the length of the smaller rectangle, then this length is the geometric mean of the length of the larger rectangle and the width of the smaller rectangle. **41.** 26 oz

42. 9187.5 **43. a.** \$17.54 **b.** 67.20 **c.** 18.42

Review for Mastery

1. $\frac{20}{17}$ **2.** 5 : 1 **3.** 30°, 54°, and 96°

4. $a = 20$ **5.** $x = 35$ **6.** $y = 21$ **7.** 9 **8.** $10\sqrt{2}$

9. $3\sqrt{10}$

Challenge Practice

1. $-8, -1$ **2.** $-\frac{1}{3}, 6$ **3.** $\frac{7}{3}, 0$ **4.** $\frac{7}{25}, 2$

5. $x = 5, y = 2$ **6.** $x = -3$ and $y = 10$ or $x = -6.4$ and $y = -7$

7. $x = 1$ and $y = 4$ or $x = -\frac{1}{6}$ and $y = \frac{19}{24}$

8. 20 cm

9. $12 + 6\sqrt{2}$ in. **10.** 24.5 cm

11. $\frac{a}{b} = \frac{c}{d}$ implies $ad = bc$.

$\frac{a}{b} = \frac{e}{f}$ implies $af = be$.

$ab = ba$ by the Symmetric property of equality

Then $ab + ad + af = ba + bc + be$

$a(b + d + f) = b(a + b + e)$

$\frac{a}{b}(b + d + f) = (a + b + e)$

$$\frac{a}{b} = \frac{a + b + e}{b + d + f}$$

12. a. 7.9 in. by 11.1 in. **b.** about 158%

c. No; *Sample answer:* the percent change in area accounts for the percent change in the length and the width so it is larger.

Lesson 6.2

Practice Level A

1. $\frac{y}{x}$ **2.** $\frac{x}{y}$ **3.** $\frac{9 + y}{y}$ **4.** $\frac{16}{11}$ **5.** true **6.** false

7. true **8.** true **9.** $\frac{6}{10} = \frac{3}{x}$ **10.** $\frac{10}{6} = \frac{x}{3}$

11. $\frac{6}{3} = \frac{10}{x}$ **12.** $\frac{16}{10} = \frac{3 + x}{x}$ **13.** $\frac{2}{3}$ **14.** 8

15. 16 **16.** 30 **17.** 15 mi **18.** 20 mi

Lesson 6.2, continued

19. 12.5 mi **20.** 16 mi **21.** 1 in.: 8 mi

22. 1 cm: 4 mi **23.** 1 in.: 50 ft **24.** 1 in.: 80 km

25. a. 36.5 cm **b.** 262 cm **c.** 6.75 in.

26. a. 1 cm: 6 mi **b.** 15 mi

Practice Level B

1. $\frac{x}{y}$ **2.** $\frac{6}{13}$ **3.** $\frac{y+7}{y}$ **4.** $\frac{x+y}{y}$ **5.** true

6. false **7.** false **8.** true **9.** true **10.** true

11. 2 **12.** 10 **13.** 12 **14.** $\frac{25}{3}$ **15.** B

16. If two ratios are equal, then their reciprocals are equal. If $\frac{a}{5} = \frac{b}{3}$, then $\frac{5}{a} = \frac{3}{b}$. **17.** 1 in. : 15 mi

18. 7 **19.** \$1750 **20.** 54 ft **21.** 2.5 in.

22. \$19.03 **23.** \$22.19 **24.** \$14.45 **25.** \$15.72

Practice Level C

1. $\frac{x}{5}$ **2.** $\frac{y+31}{y}$ **3.** $\frac{x}{z}$ **4.** $\frac{x+7}{x+2}$

5. $\frac{6.2+x}{x} = \frac{3.8+y}{y}$ **6.** $\frac{x}{6.2} = \frac{y}{3.8}$ **7.** $\frac{6.2}{3.8} = \frac{x}{y}$

8. true **9.** true **10.** false **11.** true **12.** 30

13. 28 **14.** 7.5 **15.** 34 **16.** 1 : 14 **17.** 3 : 1

18. 8 cm: 1 mm **19.** 1 cm: 1.5 in. **20.** 2.625 mi

21. 80 mi **22.** 61.5 mi **23.** 52.578 mi

24. a. 1 in. : 22 mi **b.** 27.5 mi **c.** 16.5 mi

25. 10.5 in. **26.** 28.8 oz

Review for Mastery

1. 22 **2.** 12 **3.** 5 cm : 1 mi **4.** 33 cm

Problem Solving Workshop: Using Alternative Methods

1. 15.9 ft; 36 **2.** 10 ft; 50

Challenge Practice

1. $a = 14, b = 15$ **2.** $a = -\frac{10}{3}$ and $b = -6$ or $a = 4$ and $b = 5$

3. $a = 9, b = 36$

4. No; *Sample answer:* Let $a = 4$, $b = 5$, $c = 8$, and $d = 10$. Then it is true that $\frac{4}{5} = \frac{8}{10}$.

$$\frac{4 \times 5}{5} = \frac{8 \times 10}{10}$$

$$\frac{20}{5} \stackrel{?}{=} \frac{80}{10}$$

$$4 \neq 8$$

So, the property does not hold.

5. Area $\triangle AFE = \frac{1}{2}(AF)(AE)$,

Area $\triangle BEC = \frac{1}{2}(BE)(BC)$,

Area $\triangle DFC = \frac{1}{2}(DF)(DC)$.

Also, $BC = AD = AF + FD$ and $DC = AB = AE + BE$.

So, Area $\triangle AFE = \frac{1}{2}(AF)(AE)$,

Area $\triangle BEC = \frac{1}{2}(BE)(AF + FD)$,

Area $\triangle DFC = \frac{1}{2}(FD)(AE + BF)$.

Because all the areas are equal,

$\frac{1}{2}(AF)(AE) = \frac{1}{2}(BE)(AF + FD) =$

$\frac{1}{2}(FD)(AE + BE)$.

$$(BE)(AF + FD) = (FD)(AE + BE)$$

$$(BE)(AF) + (BE)(FD) = (FD)(AE) + (FD)(BE)$$

$$\frac{(BE)(AF) + (BE)(FD)}{(BE)(FD)} = \frac{(FD)(AE) + (FD)(BE)}{(FD)(BE)}$$

$$\frac{(BE)(AF)}{(BE)(FD)} + \frac{(BE)(FD)}{(BE)(FD)} = \frac{(FD)(AE)}{(FD)(BE)} + \frac{(FD)(BE)}{(FD)(BE)}$$

$$\frac{(BE)(AF)}{(BE)(FD)} = \frac{(FD)(AE)}{(FD)(BE)}$$

$$\frac{AF}{FD} = \frac{AE}{BE}$$

$$\frac{AE}{EB} = \frac{AF}{FD}$$

6. width = 32.25 yd, length = 43 yd

7. 1.5 in.

Lesson 6.3

Practice Level A

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

2. $\angle R \cong \angle W, \angle S \cong \angle V, \angle T \cong \angle U$; $\frac{RS}{WV} = \frac{ST}{VU} = \frac{RT}{WU}$

3. $\angle C \cong \angle M, \angle D \cong \angle J, \angle E \cong \angle K, \angle F \cong \angle L$; $\frac{CD}{MJ} = \frac{DE}{JK} = \frac{EF}{KL} = \frac{CF}{ML}$

4. $\angle P \cong \angle Z, \angle Q \cong \angle W, \angle R \cong \angle X, \angle S \cong \angle Y$; $\frac{PQ}{ZW} = \frac{QR}{WX} = \frac{RS}{XY} = \frac{PS}{ZY}$