

**LESSON
6.1****Practice A**

For use with pages 372–379

Simplify the ratio.

1. $\frac{7 \text{ ft}}{14 \text{ ft}}$

2. $\frac{2 \text{ lb}}{24 \text{ lb}}$

3. $\frac{400 \text{ cm}}{10 \text{ m}}$

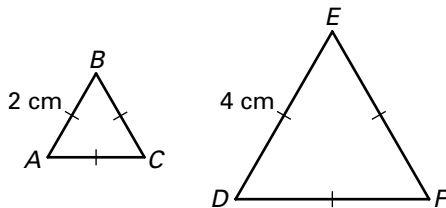
4. \$28 : \$7

5. 10 ft : 3 yd

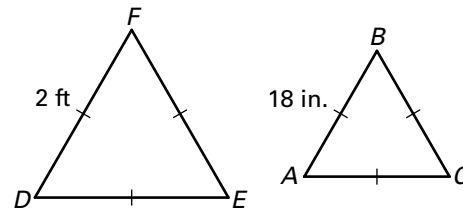
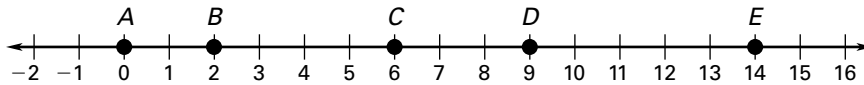
6. 1600 m : 5 km

Find the ratio of a side length in $\triangle ABC$ to a side length in $\triangle DEF$. Then simplify the ratio.

7.



8.

**Use the number line to find the ratio of the distances.**

9. $\frac{AB}{AC}$

10. $\frac{AB}{CD}$

11. $\frac{AE}{BC}$

12. $\frac{BE}{CD}$

The perimeter and the ratio of the length to the width of a rectangle are given. Find the length and width of the rectangle.

13. Perimeter: 50 in.
 $l : w = 3 : 2$

14. Perimeter: 480 ft
 $l : w = 5 : 1$

15. Perimeter: 36 cm
 $l : w = 8 : 1$

The measures of the angles of a triangle are in the extended ratio given. Find the measures of the angles of the triangle.

16. 1 : 1 : 1

17. 1 : 1 : 2

18. 2 : 3 : 4

Solve the proportion.

19. $\frac{1}{2} = \frac{x}{8}$

20. $\frac{1}{3} = \frac{3}{y}$

21. $\frac{z}{4} = \frac{15}{12}$

22. $\frac{6}{a} = \frac{3}{12}$

23. $\frac{b}{16} = \frac{18}{12}$

24. $\frac{4}{9} = \frac{24}{c}$

25. $\frac{3}{x-3} = \frac{6}{8}$

26. $\frac{3}{x} = \frac{6}{x+8}$

27. $\frac{x}{24} = \frac{x-12}{8}$

LESSON
6.1**Practice A** *continued*

For use with pages 372–379

Find the geometric mean of the two numbers.

28. 1 and 4

29. 1 and 9

30. 4 and 9

31. 2 and 50

32. 4 and 6

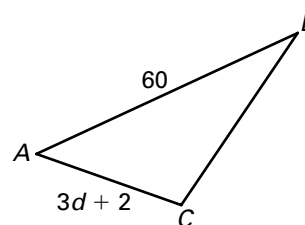
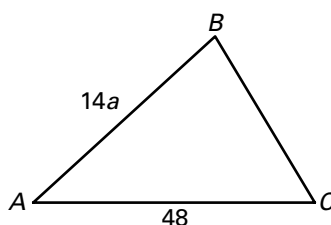
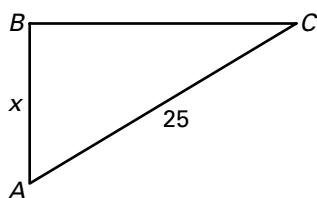
33. 3 and 15

In Exercises 34–36, the ratio of two side lengths for the triangle is given. Solve for the variable.

34. $AB:AC$ is 3 : 5.

35. $AB:AC$ is 7 : 8.

36. $AB:AC$ is 15 : 8.



37. **Swimming Pool** A rectangular swimming pool is 24 feet long and 10 feet wide. Write the ratio of the pool's width to its length in simplest form.
38. **Real Estate** A rectangular plot of land has a perimeter of 392 feet and the length and width are in the ratio 3 : 1. What are the length and width?
39. **Class Size** In a high school where the ratio of seniors to underclassmen is 1 : 5, there are 125 seniors. How many underclassmen are there?
40. **Election** Three candidates run for an office in a local election. In all, 12,936 votes are cast, and the breakdown of votes for the three candidates is in the extended ratio 3 : 4 : 5. Find the actual numbers of votes cast for the three candidates.
41. **Savings** You have an amount of money in a savings account that earns simple interest at a fixed rate of 2.2% per year. From year to year, you do not deposit or withdraw money from the account. Write the ratio in simplest form of the amount in this account in the year n to the amount in the year $n - 1$.
42. **Television** The aspect ratio of a television screen is the ratio of the screen's width to its height. A widescreen TV has an aspect ratio of 16 : 9.
- What is the height of a widescreen TV if its width is 26 inches?
 - What is the width of a widescreen TV if its height is 13 inches?
 - A television screen has a width of 28 inches and a height of 21 inches. What is the aspect ratio of this screen?

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. $l = 15 \text{ in.}, w = 10 \text{ in.}$
 14. $l = 200 \text{ ft}, w = 40 \text{ ft}$ 15. $l = 16 \text{ cm}, w = 2 \text{ cm}$ 16. $60^\circ, 60^\circ, 60^\circ$ 17. $45^\circ, 45^\circ, 90^\circ$
 18. $40^\circ, 60^\circ, 80^\circ$ 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. $l = 147 \text{ ft}, w = 49 \text{ ft}$ 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. $10^\circ, 70^\circ, 100^\circ$
 17. $50^\circ, 60^\circ, 70^\circ$ 18. $35^\circ, 70^\circ, 75^\circ$ 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. $l = 42 \text{ cm}, w = 24 \text{ cm}$
 13. $l = 77 \text{ ft}, w = 63 \text{ ft}$ 14. $l = 119 \text{ yd}, w = 91 \text{ yd}$ 15. $30^\circ, 75^\circ, 75^\circ$ 16. $27^\circ, 63^\circ, 90^\circ$
 17. $28^\circ, 64^\circ, 88^\circ$ 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. $y = 39 \text{ m}$
 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. $l = 24 \text{ ft}, w = 8 \text{ ft}$ 37. $l = 21 \text{ yd}, w = 14 \text{ yd}$

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. $30^\circ, 54^\circ, \text{ and } 96^\circ$
 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. $12 + 6\sqrt{2} \text{ in.}$ 10. 24.5 cm

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

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

$ab = ba$ 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