Find each unit rate.

1. \$57 for 6 hours
2. $\frac{\$2}{5\text{ lb}}$
3. $\frac{524\text{ cars}}{4\text{ weeks}}$
4. $\frac{600\text{ calories}}{1.5\text{ h}}$
5. A 10-ounce bottle of shampoo costs \$2.40. What is the cost per ounce?
6. A 12-ounce bottle of juice costs \$1.08. What is the cost per ounce?

Choose A or B for the correct conversion factor for each situation.

7. quarts to gallons
   A. $\frac{1\text{ gal}}{4\text{ qt}}$ B. $\frac{4\text{ qt}}{1\text{ gal}}$
8. ounces to pounds
   A. $\frac{1\text{ lb}}{16\text{ oz}}$ B. $\frac{16\text{ oz}}{1\text{ lb}}$
9. inches to yards
   A. $\frac{36\text{ in.}}{1\text{ yd}}$ B. $\frac{1\text{ yd}}{36\text{ in.}}$
10. miles to feet
    A. $\frac{5280\text{ ft}}{1\text{ mi}}$ B. $\frac{1\text{ mi}}{5280\text{ ft}}$

Complete each statement.

11. 8 h = ■ min
12. 120 cm = ■ m
13. 3 h = ■ s

Solve each proportion.

14. $\frac{5}{6} = \frac{c}{9}$
15. $\frac{3}{8} = \frac{x}{30}$
16. $\frac{2}{8} = \frac{n}{20}$
17. $\frac{7}{5} = \frac{k}{18}$
18. $\frac{3}{4} = \frac{x}{10}$
19. $\frac{4}{6} = \frac{m}{9}$
20. $\frac{8}{d} = -\frac{12}{30}$
21. $\frac{5}{9} = \frac{8}{w}$
22. $\frac{2}{14} = \frac{m}{63}$
23. $-\frac{8}{11} = \frac{12}{v}$
24. $\frac{4}{9} = \frac{b}{15}$
25. $\frac{3}{k} = -\frac{20}{35}$
26. $\frac{q}{42} = \frac{15}{7}$
27. $\frac{6}{8} = \frac{21}{x}$
28. $\frac{7}{n} = \frac{35}{88}$
29. $\frac{20}{18} = \frac{75}{w}$

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30. A canary's heart beats 200 times in 12 seconds. Use a proportion to find how many times its heart beats in 42 seconds.

31. Suppose you traveled 66 kilometers in 1.25 hours. Moving at the same speed, how many kilometers would you cover in 2 hours?

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Solve each proportion.

32. $\frac{x+3}{4} = \frac{7}{8}$

33. $\frac{a-6}{5} = \frac{7}{12}$

34. $\frac{8}{9} = \frac{w-2}{6}$

35. $\frac{1}{c+5} = \frac{2}{3}$

36. $\frac{8}{b+10} = \frac{4}{2b-7}$

37. $\frac{k+5}{10} = \frac{k-12}{9}$

Skills

Complete each statement.

38. \$2/lb = ■ ¢/oz

39. \$3/lb = ■ ¢/oz

40. 4¢/day = \$ ■/yr

41. 5¢/day = \$ ■/yr

42. 5 cm/min = ■ m/week

43. 1 qt/min = ■ gal/week

Express each rate in miles per hour.

44. 1 mi in 3 min

45. 1 mi in 4 min

46. 1 mi in 300 s

47. 10,560 ft in 2 h

48. 21,120 ft in 4 h

49. 270 ft in 10.8 min

50. You are riding your bicycle. It takes you 21 min to go 5 mi. If you continue traveling at the same rate, how long will it take you to go 12 mi?

51. **Hair** Human hair grows at a rate of about 0.35 mm per day. How much does it grow in 30 days?

52. **Record Speed** According to the *Guinness Book of World Records*, the peregrine falcon has a record diving speed of 168 miles per hour. Write this speed in feet per second.

Solve each proportion.

53. $\frac{m+12}{9m} = \frac{5}{9}$

54. $\frac{p}{20} = \frac{p-4}{5}$

55. $\frac{n+12}{4} = \frac{n}{16}$

56. $\frac{29}{24} = \frac{b+24}{b}$

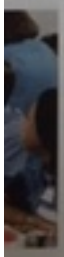
57. $\frac{w}{15} = \frac{w-9}{12}$

58. $\frac{9}{3t-6} = \frac{6}{0.2t+4}$

59. $\frac{n+2}{25} = \frac{n-4}{35}$

60. $\frac{q-11}{q+13} = \frac{2}{3}$

61. $\frac{18+d}{14-d} = \frac{3}{7}$



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Data Analysis **Below are the survey results of 60 students out of 1250 students in a school. These results are representative of the school population. Use the table for Exercises 62–64.**

Question	Number Answering Yes
Do you work on weekends?	31
Do you spend 2 or more hours per night on homework?	36
Do you buy lunch in the school cafeteria?	48

62. Predict the number of students in the school who work on weekends.

63. Predict the number of students in the school who spend 2 or more hours per night on homework.

64. Predict the number of students in the school who buy lunch in the school cafeteria.

65. Writing Write an explanation telling an absent classmate how to use cross products to solve a proportion. Include an example.

66. Gasoline Cost Your car averages 34 miles per gallon on the highway. If gas costs $1.79 per gallon, how much does it cost in dollars per mile to drive your car on the highway?

67. Demographics Population density is a unit rate describing the number of individuals per unit of area. An example of population density is 5 people per square mile. Use the diagram below. Find the population densities of Mongolia, Bangladesh, and the United States. Round your answers to the nearest integer.

68. Open-Ended Estimate your walking rate in feet per second. Write this rate in miles per hour.

69. a. Solve the proportions $\frac{x-1}{x} = \frac{6}{7}$ and $\frac{x-2}{x} = \frac{6}{7}$.

b. Based on your answers to part (a), predict the answer for $\frac{x-3}{x} = \frac{6}{7}$.

c. Check your answer for $\frac{x-3}{x} = \frac{6}{7}$.

d. Critical Thinking For the ratio $\frac{x-a}{x} = \frac{6}{7}$, describe the relationship between a and x.

70. Bonnie and Tim do some yardwork for their neighbor. The ratio comparing the amount of time each one works is 7:4. The neighbor pays them $88. If Bonnie worked more, how much should each of them receive?

71. Engineering Transformers use coils of wire to increase or decrease voltage. The following proportion relates the number of turns of wire in the coils to the voltages. (*Note:* Each semi-circle in the diagram represents a turn of wire.)

$$\frac{\text{primary turns}}{\text{secondary turns}} = \frac{\text{primary voltage}}{\text{secondary voltage}}$$

Suppose the primary-coil voltage is 120 volts. Use the proportion $\frac{5}{2} = \frac{120}{v}$ to find the secondary-coil voltage.

72. Find y if $\frac{12}{16} = \frac{8}{24}$ and $\frac{5}{56} = \frac{7}{81}$.

Solve each proportion.

73. $\frac{x^2-3}{5x+2} = \frac{4}{5}$

74. $\frac{w^3+7}{w} = \frac{9w^2+7}{9}$

75. $\frac{m^2-8}{3m} = \frac{4m+1}{12}$

76. Sports Long-distance runners usually refer to their speed in terms of pace, a rate measured in minutes per mile rounded to the nearest hundredth.

a. Naoko Takahashi of Japan won the gold medal in the marathon at the 2000 Olympic games. She set an Olympic record, completing the 26.2-mile race in 2:23:14 (2 hours, 23 minutes, 14 seconds). Find her pace.

b. Tegla Loroupe of Kenya set the women's world record at the 1999 Berlin marathon. Her time was 2:20:43. Find her pace.