

Exercises: Set up a proportion to solve each of the following word problems.

1. A car averages 12 gallons of gasoline for each 420 miles driven. How much gasoline will it need for a 3,360-mile trip?
2. A \$9 sales tax is charged for a \$200 purchase. At this rate, what is the sales tax for a \$300 purchase?
3. A life insurance policy costs \$6.88 for every \$1,000 of insurance. At this rate, what is the cost for \$17,500 worth of life insurance?
4. A cabinet maker used $\frac{3}{4}$ gallons of varnish on 10 cabinet doors. At this rate, how many quarts of varnish are required for 25 cabinet doors?
5. A stock investment of 50 shares paid a dividend of \$125. At this rate, what dividend would be paid for 325 shares of stock?
6. A biologist estimates that the human body contains 90 pounds of water for every 100 pounds of body weight. At this rate, estimate the number of pounds of water in a child who weighs 80 pounds.
7. If 21 sandwiches are needed at an outing for 14 people, how many sandwiches would be needed for 30 people?
8. If a pole 18 feet high casts a shadow 20 feet long, how long a shadow would a pole 27 feet high cast?
9. A doctor's prescription calls for $\frac{1}{5}$ ounce of a particular ingredient for every 20 pounds of body weight. How many ounces of this ingredient would be needed by someone weighing 175 pounds?
10. A farm containing 36.5 acres sells for \$5,840. What would a farm of 124 acres sell for at the same rate?

Solutions to the odd-numbered exercises and answers to the even-numbered exercises:

1. $\frac{12 \text{ gallons}}{420 \text{ miles}} = \frac{x \text{ gallons}}{3,360 \text{ miles}}$

$$420(x) = 12(3,360)$$

$$420x = 40,320$$

$$\frac{420x}{420} = \frac{40,320}{420}$$

$$x = 96$$

96 gallons of gas will be needed for a 3,360-mile trip.

3. \$6.88 cost : \$1,000 insurance :: \$x cost : \$17,500 insurance

$$\frac{\$6.88 \text{ cost}}{\$1,000 \text{ insurance}} = \frac{\$x \text{ cost}}{\$17,500 \text{ insurance}}$$

$$\frac{6.88}{1,000} = \frac{x}{17,500}$$

$$1000(x) = 6.88(17,500)$$

$$000x = 120,400$$

$$\frac{1000x}{1000} = \frac{120,400}{1000}$$

$$\frac{1000x}{1000} = \frac{120,400}{1000}$$

$$x = 120.4$$

The cost for \$17,500 worth of insurance is \$120.40.

5. $\frac{50 \text{ shares}}{\$125} = \frac{325 \text{ shares}}{\$x}$

$$50(x) = 125(325)$$

$$50x = 40,625$$

$$\frac{50x}{50} = \frac{40,625}{50}$$

$$x = 812.5$$

A \$812.50 dividend would be paid for 325 shares of stock.

2. The sales tax on a \$300 purchase is \$13.50.

4. 7.5 quarts of varnish are required for 25 cabinets.
(Hint: Change 3/4 gallons to quarts.)

6. A child weighing 80 pounds would contain about 72 pounds of water.

$$7. \frac{21 \text{ sandwiches}}{14 \text{ people}} = \frac{x \text{ sandwiches}}{30 \text{ people}}$$

$$14(x) = 21(30)$$

$$14x = 630$$

$$\frac{14x}{14} = \frac{630}{14}$$

$$x = 45$$

45 sandwiches would be needed for 30 people.

$$9. \frac{\frac{1}{5} \text{ ounce}}{20 \text{ pounds}} = \frac{x \text{ ounces}}{175 \text{ pounds}}$$

$$20(x) = \frac{1}{5}(175)$$

$$20x = 35$$

$$\frac{20x}{20} = \frac{35}{20}$$

$$x = 1.75$$

Someone weighing 175 pounds would need 1.75 ounces of the ingredient in the prescription.

8. The shadow cast by a pole 27 feet high would be 30 feet long.

10. A 124-acre farm would sell for \$19,840.