

**Objectives**

- Evaluate formulas.
- Solve formulas for a particular variable.

**Definition 1.** A formula is an equation that shows a relationship between different variable quantities. For instance,  $A = \frac{1}{2}bh$  is a formula representing the area of a triangle.

**Exercises**

1. Evaluate each formula with the given values.
  - a) When a ball is thrown upward at a speed of 18 m/s, its height  $h$  above the ground (in meters) after  $t$  seconds is given by the formula  $h = 18t - 4.9t^2$ . Find the height of the ball after 3 seconds.
  - b) The perimeter of a rectangle with length  $L$  and width  $W$  is given by the formula  $P = 2L + 2W$ . Find the perimeter of a rectangle with length 7 meters and width 5 meters.
  - c) The formula relating degrees Celsius with degrees Fahrenheit is  $F = \frac{9}{5}C + 32$ . Convert  $30^\circ$  Celsius to degrees Fahrenheit.

To Solve a Formula for a Given Variable

1. If the variable that you are solving for is in a fraction, use the Multiplication Property of Equality to derive an equivalent equation having no fractions.
2. Use the Addition Property of Equality to get all terms with the variable you are solving for by themselves on one side of the equation.
3. If two or more terms have the variable you are solving for, then factor the variable out.
4. Multiply or divide to solve for the variable in question.

2. Solve each formula for the indicated letter.

- a) Solve  $A = \pi r^2$  for  $\pi$
- b) Solve  $d = rt$  for  $t$
- c) Solve  $A = \frac{a + b + c}{3}$  for  $b$
- d) Solve  $5x - 2y = 1$  for  $y$
- e) Solve  $t = 27 - \frac{1}{4}(w - l)$  for  $l$
- f) Solve  $A = P + Prt$  for  $P$

e)  $l = 4t - 108 + w$  (f)  $d = \frac{A}{r}$

Answers: 1a) 9.9 m, b) 24 m, c)  $86^\circ$  F, 2a)  $x = \frac{A}{\pi}$ , b)  $t = \frac{d}{r}$ , c)  $b = \frac{3A - a - c}{2}$ , d)  $y = \frac{5x - 1}{2}$ , e)  $l = 4t - 108 + w$ , f)  $d = \frac{A}{r}$