Section 2.6 Formulas and Problem Solving

# Objective 1: Using Formulas to Solve Problems

# An equation that describes a known relationship among quantities is called a formula. For example, if we know that someone traveled $100$ miles at a rate of $40$ miles per hour, we can use the formula $d=rt$ to determine that they traveled for $2.5 $hours.

$$d=rt$$

$$100=40t$$

$$2.5=t$$

Substitute the given values into the formula and solve for the unknown variable.

a. $A=\frac{1}{2}h(B+b)$; $A=42$, $B=6$, $b=1$; $h=?$

b. $I=PRT$; $I=3900$, $P=26000$, $R=0.05$; $T=?$

The formula $F=\frac{9}{5}C+32$ converts temperature from degrees Celsius to degrees Fahrenheit.

c. What is $40℃$ in degrees Fahrenheit?

d. What is $212℉$ in degrees Celsisu?

# Objective 2: Solving a Formula for One of Its Variables

It is sometimes useful to rearrange a formula to solve for a different variable. For example, the formula $d=rt$ can be rearranged to solve for $r$ by dividing both sides by $t$.

$$r=\frac{d}{t}$$

It can also be rearranged to solve for $t$ by dividing both sides by $r$.

$$t=\frac{d}{r}$$

We can select which version of the formula to use depending on what quantity we are trying to find.

a. Rearrange the formula $F=\frac{9}{5}C+32$ to solve for $C$.

b. The formula for finding the volume of a cone is given by $V=\frac{1}{3}πr^{2}h$. Solve the formula for $h$.

c. The formula for finding the perimeter of a rectangle is $P=2w+2l$. Solve the formula for $l$.

d. A rectangular enclosure is to be constructed using $150$ feet of fencing. If the width of the enclosure is $23$ feet, what is its length?