

**Example 5**

The length of a rectangle is 4 inches more than 5 times the width. If the perimeter of the rectangle is 44 inches, what are the dimensions?

$$l = 5w + 4$$

$$44 = 2l + 2w$$

Width = 3 in.  
Length = 19 in.

$$44 = 2(5w + 4) + 2w$$

$$44 = 10w + 8 + 2w$$

$$44 = 12w + 8$$

$$36 = 12w$$

$$3 = w$$

$$3 = w$$

**Example 7**

You are making a saline solution in science class. One hundred milliliter of a 50% saline solution is obtained by mixing a 40% saline solution with a 60% saline solution. How much of each must you use?

$$\% .4x + .6y = .5(100)$$

$$\# (x + y = 100) \cdot (.4)$$

$$-.4x + .6y = 50$$

$$-.4x + .4y = 40$$

$$.2y = 10$$

$$.2 \quad .2$$

$$y = 50$$

$$y = 50 \text{ mill.}$$

$$x = 50 \text{ mill.}$$

**Example 6**

On a typical day with light winds, the 1800 mile flight from Charlotte, NC to Phoenix AZ takes longer than the return trip because the plane has to fly into the wind.

$$d \begin{matrix} C \rightarrow P = 1800 \\ S \ P \rightarrow C = 1800 \end{matrix}$$

The flight from Charlotte to Phoenix is 4 hours and 30 minutes long, the flight from Phoenix to Charlotte is 4 hours long. Find the average speed of the airplane on the way to Phoenix and on the return trip to Charlotte.

$$\begin{matrix} C \rightarrow P = 4 \text{ hrs } 30 \text{ mins} \\ P \rightarrow C = 4 \text{ hrs} \end{matrix}$$

Then find the speed of the plane and the speed of the wind.

$$C \rightarrow P: P - W = 400$$

$$P \rightarrow C: P + W = 450$$

$$2P = 850$$

$$\begin{matrix} P = 425 \text{ m/h} \\ W = 25 \text{ m/h} \end{matrix}$$

C → P m/h	P → C m/h
1800	1800
4.5	4
400 m/h	450 m/h

**Example 8**

A 1.5% acid solution is mixed with a 4% acid solution. How many ounces of each solution are needed to obtain 60 ounces of 2.5% acid solution?

$$\# : x + y = 60$$

$$\% : .015x + .04y = 60(.025)$$