Section 6.5: Perimeter, Value Interest, and Mixture Problems

1. An artist wants an piece of canvas whose length is 1.62 times its width, and whose perimeter is 9 feet. Find the dimensions of the canvas by doing the following:

   (a) Write down an equation for the length L of the canvas in terms of the width W.

   (b) Write down an equation for the perimeter P of the canvas in terms of the length L and the width W.

   (c) Given that $P = 9$, you now have a system of two equations in the variables L and W. A solution to this system of equations is an ordered pair (L, W) of numbers representing the length and width of the desired canvas. Find a solution to this system of equations.

2. A person wants to invest a total of 7000 dollars in two different accounts, the first has an annual interest rate of 2.5%, and the second has an annual interest rate of 12%. How much money should this person invest in each account in order to make \$400 of interest in one year.

   (a) Use the variable x to represent the amount of money invested in the first account, and the variable y to represent the amount of money invested in the second account. Write down an equation for the amount of interest I that is made in one year in terms of x and y.

   (b) Write down an equation representing the total amount T invested is terms of x and y.

   (c) Now given that T = \$7000, and I = \$400, you have a system of two equations in the variables x and y. Find a solution of this system, and explain what this means in this situation.

3. A vendor charges \$5 dollars per hamburger and \$3 dollars per hot dog.

   (a) What is the vendor's total revenue from selling 40 hamburgers and 85 hot dogs?

   (b) Find an equation for the total revenue R when the vendor sells B hamburgers and D hot dogs.

   (c) The vendor sells a total of 135 hamburgers and hot dogs for a total revenue of \$495. How many hamburgers did the vendor sell? How many hot dogs did the vendor sell?

4. A chemist needs 8 liters of a 20% alcohol solution, but only has a 15% alcohol solution and a 35% alcohol solution. How many liters of each solution should the chemist mix to make the desired 8 liters of 20% alcohol solution?