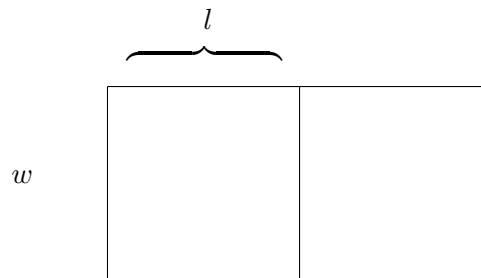


## Worksheet # 2

Don't forget to use your neighbors and play around with the ideas presented here.

1. Everyone knows the formula  $Area = width \times length$  for a rectangular field. The formula gets more complicated if you want to construct two corrals of equal size as in the figure below.



Come up with an equation that represents the *Area* of the two corrals. Enter it into the **Numeric Solver** in your calculator and answer the following questions.

Find the *Area* if:

$$w = 15$$

$$l = 27$$

$$A =$$

$$w = 55$$

$$l = 220$$

$$A =$$

$$w = 55 \qquad l = 550 \qquad A =$$

$$w = 200 \qquad l = 75 \qquad A =$$

$$w = -8 \qquad l = 103 \qquad A =$$

Find the *width* if:

$$l = 100 \qquad A = 6785 \qquad w =$$

$$l = 525 \qquad A = 185,000 \qquad w =$$

$$l = 430 \qquad A = 260,580 \qquad w =$$

$$l = 600 \qquad A = 878,400 \qquad w =$$

Find the *length* if:

$$w = 25 \qquad A = 6,250 \qquad l =$$

$$w = 73.5 \qquad A = 12,300 \qquad l =$$

$$w = 79 \qquad A = 22,752 \qquad l =$$

$$w = \frac{1}{100} \qquad A = 3 \qquad l =$$

Find the equation for the *Perimeter* of our two corrals and enter it into the **Numeric Solver**. Answer the following questions.

Find the *Perimeter* if:

$$w = 25 \qquad l = 36 \qquad P =$$

$$w = 120 \qquad l = 180 \qquad P =$$

$$w = 43.789 \qquad l = 59.231 \qquad P =$$

Find *length* if:

$$w = 75 \qquad P = 550 \qquad l =$$

$$w = 23 \qquad P = 293 \qquad l =$$

$$w = 100 \qquad P = 726 \qquad l =$$

$$w = 2,250 \qquad P = 1,000 \qquad l =$$

Find the *width* if:

$$l = 32.3 \qquad P = 185.3 \qquad w =$$

$$l = 37 \qquad P = 160 \qquad w =$$

$$l = 200 \qquad P = 1367 \qquad w =$$

$$l = 8 \qquad P = .01 \qquad w =$$

2. Let's investigate an equation that can have more than one solution.

Enter:

$$a * x^2 + b * x + c = 0$$

into your **Numeric Solver**.

Give the variables the following values,

$$a = -1 \text{ , } b = 2.5 \text{ , } c = 21 \text{ .}$$

The remaining unknown  $\mathbf{x}$  has two possible solutions. One near  $-5$  and one near  $5$ . Find them.

Give the variables the values  $a = -.1$  ,  $b = .5$  ,  $c = 5$  , and find the two solutions.

Given  $a = \frac{1}{6}$  ,  $b = 3 + \frac{1}{3}$  ,  $c = 5 + \frac{1}{3}$ . Both the solutions for  $\mathbf{x}$  are negative. Find them.

Given  $a = .25$  ,  $b = -7$  ,  $c = 49$ . There is only one solution for  $\mathbf{x}$ . Find it.

Suppose we want  $x = 2$  to be a solutions of the equation. Let  $b = 6$  and  $c = -3$ . What does the **Numeric Solver** get for  $a$ ?

3. Let us use the **Numeric Solver** for economics, enter the following cost function.

$$\text{cost} = \text{fixed} + a * q^3 + b * q^2 + c * q$$

Give the variables the following values,

$$\text{fixed} = 2000$$

$$a = .0033$$

$$b = -1.5$$

$$c = 225$$

To find the cost producing a quantity of 150 units make  $q = 150$ . Find the cost.

Find the cost for  $q = 50, 100,$  and  $200$ .

Find what quantity keeps cost at \$12000.

Change our variables to  $a = .5, b = -2, c = 100$ .

What happens to cost?

Done in T<sub>E</sub>X.