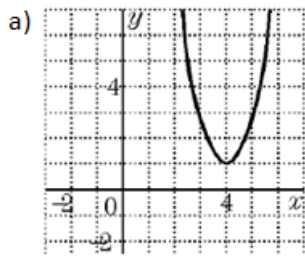
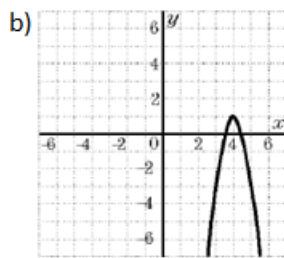


**SOLUTION for Pre-Calculus 11 HW 4.2 Solving Quadratic Equations by Factoring**

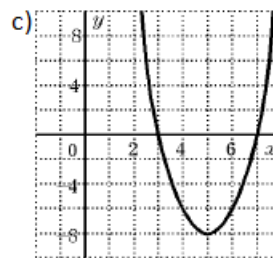
1. Indicate the number of roots for each of the following quadratic functions:



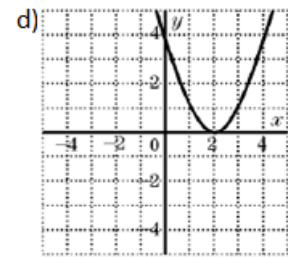
NO Roots



Two Roots



Two Roots



One Distinct Root

2. Given a quadratic function in the form of  $y = a(x - p)^2 + q$ :

a. If  $a > 0$  and  $q > 0$ , then the function will not have any roots: TRUE or FALSE (Explain)

Graphs opens up and shifted up, therefore no roots [TRUE]

b. If  $a < 0$  and  $q > 0$ , then the function will have only one root: TRUE or FALSE (Explain)

Graph opens down and shifted up, therefore two roots [FALSE]

c. If  $a < 0$  and  $p < 0$ , then the function will at least one root: TRUE or FALSE (Explain)

Graph opens down and shifted left. However graph can be shifted up or down resulting with 0,1, or 2 roots. FALSE

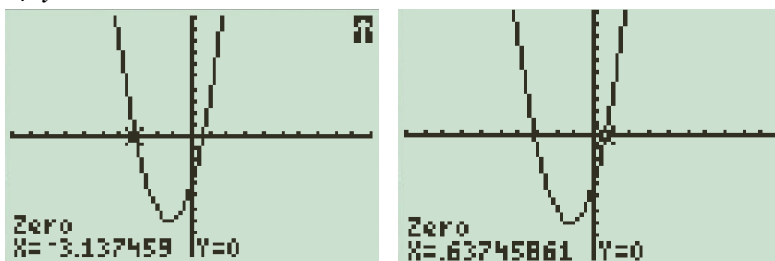
d. If  $a \times q < 0$  then the function will have two roots: TRUE or FALSE (Explain)

Either "a" or "q" is negative:

So opens down and shifted up OR opens up and shifted down. Either case, we will have two roots for sure [TRUE]

3. Use a graphing calculator to find the roots (x-intercepts) for each quadratic function. Graph the quadratic equation with the grid provide:

a)  $y = 2x^2 + 5x - 4$



a)  $y = -2x^2 + 6x - 2$

c)  $y = 4x^2 + 12x + 9$

d)  $y = 4x^2 + 5x + 3$

4. The height of a football tossed by the quarterback is given by the equation  $h = -4.9t^2 + 19t + 1.4$ , where "t" is the numbers of seconds after the ball is tossed. Find out how long it will take for the ball to hit the ground.

Graph the equation and find the x-intercept. Make sure the x-intercept is positive! Can't have negative time

5. 24 meters of fencing are used to enclose a rectangular garden.  
i) Write an equation for the area (A) of the garden as a function of the length of one side.

Let the length be "L" and the width be "W"

$$2L + 2W = 24$$

$$L + W = 12$$

$$L = 12 - W$$

The area will be the product of the length and width:

$$A = L \times W$$

$$A = (12 - W)W$$

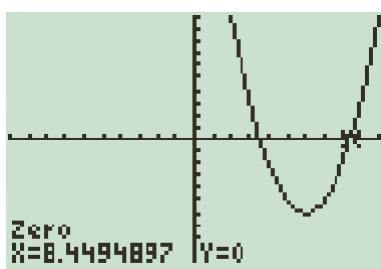
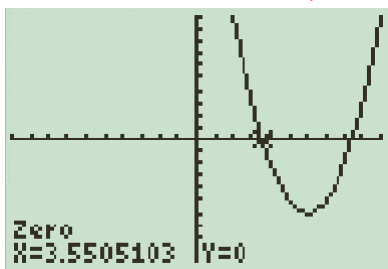
$$A = -W^2 + 12W$$

- ii) Then find the length of one side if the area of the garden is 30m<sup>2</sup>

$$30 = -W^2 + 12W$$

$$W^2 - 12W + 30 = 0$$

Make the "W" variable equal to "x".



There are two roots, the first root can be the width and the second can be the length. OR Since the variables "L" and "W" are interchangeable, the dimensions can be the other way around