MATH 125 College Algebra   Name______________________________

Standard Form for Quadratic Functions

$y = a(x-h)^2 + k$

if $a > 0$ then the graph opens up, hence a minimum

if $a < 0$ then the graph opens down, hence a maximum

Vertex is at (h, k)

Axis of Symmetry is $x = h$

$y = ax^2 + bx + c \quad \Rightarrow \quad$ Axis of Symmetry is $x = -\dfrac{b}{2a}$

$\langle$ex$\rangle$ $\quad y = x^2 + 12x + 30$

$$y = \left[\, x^2 + 12x \,\right] + 30$$

$$y = \left[\, x^2 + 12x \qquad \right] + 30$$

$$y = (\, x \qquad)^2$$

Vertex: ___________

$\langle$ex$\rangle$ $\quad y = -5x^2 - 8x + 10$

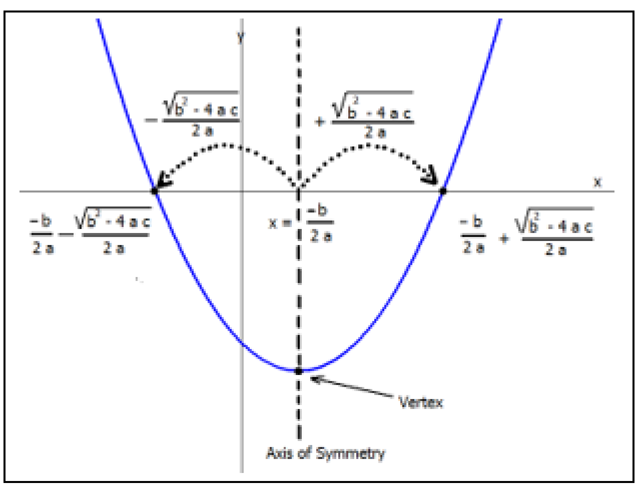
$$y = \left[\, -5x^2 - 8x \,\right] + 10$$

$$y = -5\left[\, x^2 + \frac{8}{5}x \,\right] + 10$$

$$y = -5\left[\, x^2 + \frac{8}{5}x \qquad \right] + 10$$

$$y = -5\left(\, x \qquad \right)^2$$

Vertex: ___________



$$y = a\,x^2 + b\,x + c$$

$$y = 0$$

$$\Downarrow$$

$$0 = a\,x^2 + b\,x + c$$

$$\Downarrow$$

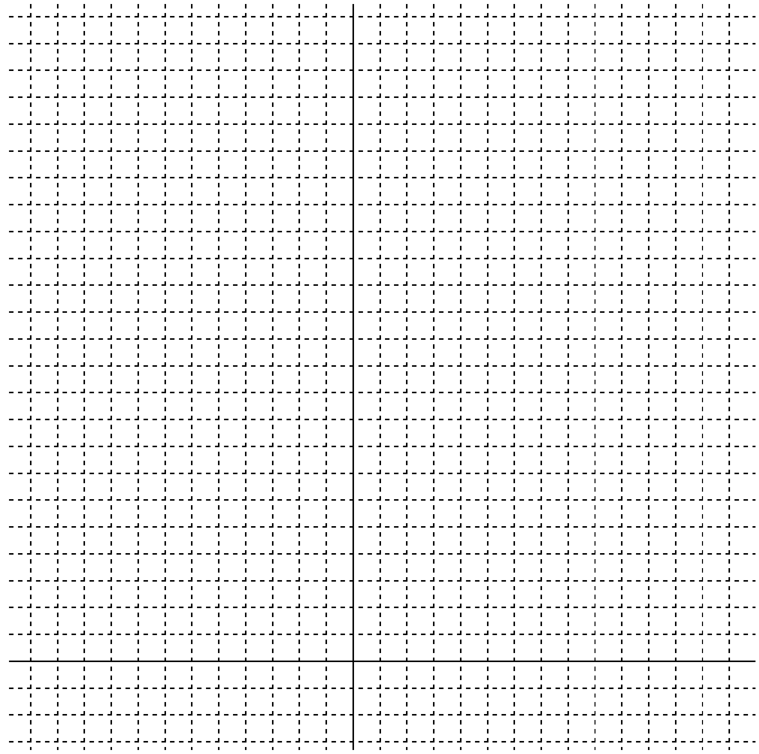
$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$\Downarrow$$

$$x = \frac{-b}{2a} \pm \frac{\sqrt{b^2 - 4ac}}{2a}$$

$\langle \mathrm{EX} \rangle \quad y = -2x^2 + 12x + 5$

Vertex:_________ Axis of Symmetry:_____________



y-intercept:__________

x-intercept(s):______________________

Domain:___________ Range:____________________

Standard form of the quadratic_____________________

Does the function have a maximum or minimum value?

What is it?___________

A popular designer purse sells for $400 and 55,000 are sold a month. The company did some research and realized that for each **$20 decrease in price**, they can sell **5000 more purses** per month. How much should the company charge for the purse so they can **maximize monthly revenues**? Note: letting ***x* = the number of $20 decreases**

$revenue = (price) \cdot (numbersold)$

Let's say we are building **rectangular** vegetable garden against the back of our house with a fence around it, but we only have **120 feet** of fencing available. What would be the dimensions (length and width) of the garden (the house serves as an edge) to make the area of the garden **as large as possible**? Also, what is this area? Also, what is a **reasonable domain** for the **width** of the garden?