Algebra I

Notes Section 9.2

Graph $y = ax^2 + bx + c$

Big Ideas

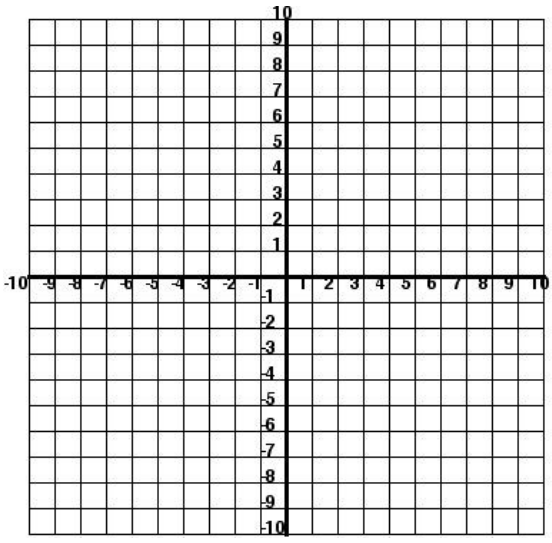
1. How to graph and compare other graphs to the parent function.
2. How to find the vertex, axis of symmetry, y-intercept and reflection.
3. How to find the maximum or minimum values.
4. How to determine if the parabola opens up or down.

How to graph a Quadratic Equation

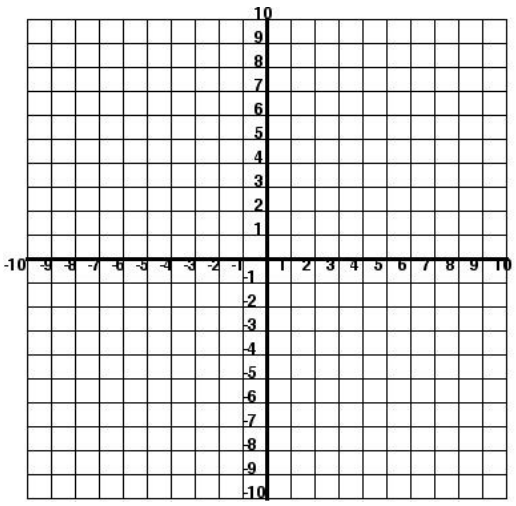
1. Find the x-coordinate $x = -b/2a$
2. Find the y-coordinate sub x into the original equation and solve
3. Write the x-coordinate & y-coordinate as the vertex V(x,y)
4. Find the y-intercept Sub Zero into the original equation and solve
5. Graph all points and find the reflection point of the y-intercept.

EXAMPLE 1 Graph the functions.

a) $y = x^2 - 2x - 3$



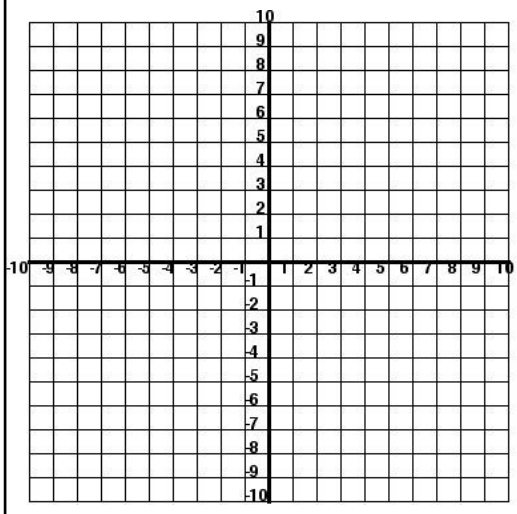
b) $y = -2x^2 + 12x - 7$

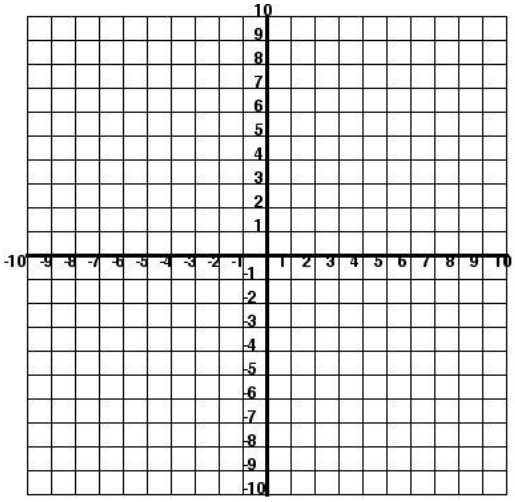


EXAMPLE 2 Graph the functions.

a) $y = 3x^2 - 6x + 2$

b) $y = 2x^2 - 8x + 7$





Minimum Value: _____

_____

Maximum Value: _____

_____

EXAMPLE 3 Tell whether the function has a minimum or maximum value. Then find the minimum or maximum value.

a) $f(x) = -3x^2 - 12x + 10$

b) $f(x) = 2x^2 - 16x + 4$

EXAMPLE 4 The suspension cables between the two towers of the Mackinac Bridge in Michigan form a parabola that can be modeled by the graph of $y = 0.000097x^2 - 0.37x + 549$ where x and y are measured in feet. What is the height of the cable above the water at its lowest point?