

Chapter 10: Quadratic Equations and Functions Study Guide

10.1: Graph $y = ax^2 + c$:

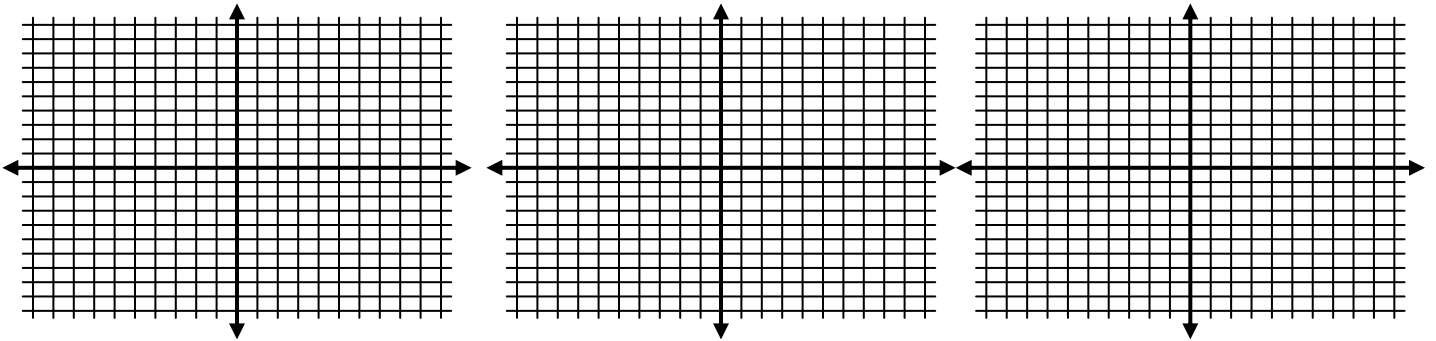
- Be able to graph a quadratic using a table and compare it to the parent function.

Graph the following quadratic equations by making a table. Compare the graph to the parent function.

Ex: $y = x^2$

Ex: $y = -2x^2$

Ex: $y = \frac{1}{3}x^2 - 2$



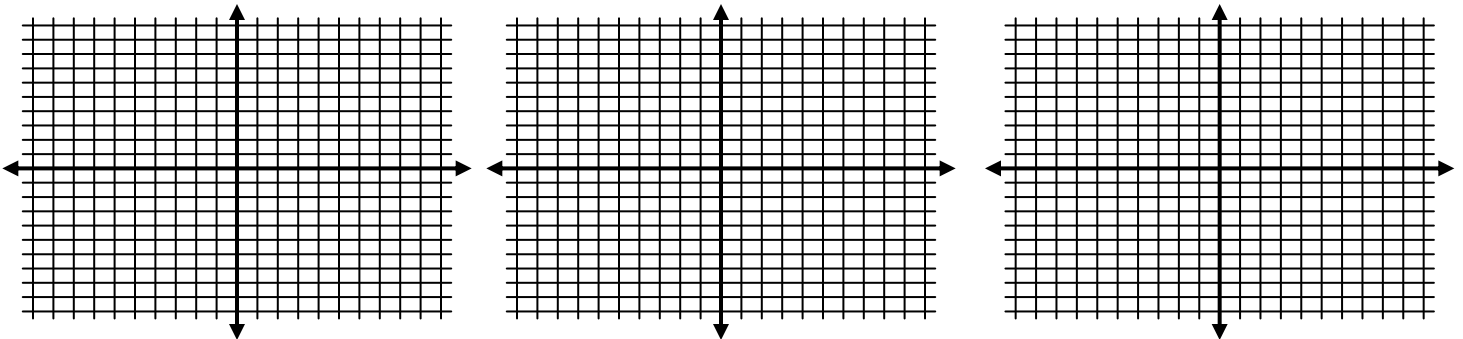
- Be able to identify characteristics of quadratic equations based on a and c changing and sketch the resulting parabola.

Sketch the parent function, then sketch the following parabolas based on the equation.

Ex: $y = 3x^2 + 5$

Ex: $y = -x^2 - 4$

Ex: $y = -\frac{2}{3}x^2 + 6$



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

- Be able to find the axis of symmetry and vertex of a parabola.

Find the axis of symmetry and vertex of each quadratic equation.

Ex: $y = 2x^2 - 8x + 6$

Ex: $y = -3x^2 + 24x - 22$

- Be able to tell if a quadratic equation has a maximum or minimum value, then find the max. or min.

Tell whether the function has a *minimum* or *maximum* value. Then find the min. or max. value.

Ex: $f(x) = -3x^2 + 12x - 20$

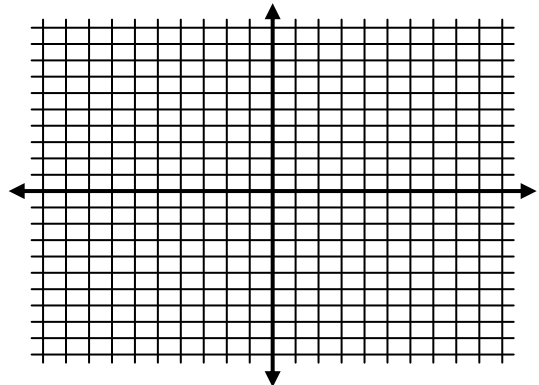
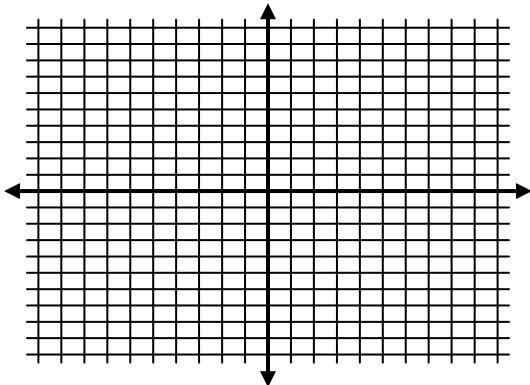
Ex: $f(x) = 4x^2 + 32x$

- Be able to graph a quadratic function in the form $y = ax^2 + bx + c$ by finding the axis of symmetry and vertex and making a symmetrical table about the axis.

Graph the quadratic function.

Ex: $y = x^2 + 6x + 2$

Ex: $y = -4x^2 + 4x + 8$

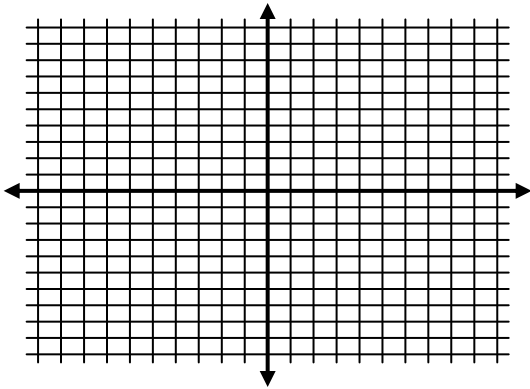


10.3: Solve Quadratic Equations by Graphing:

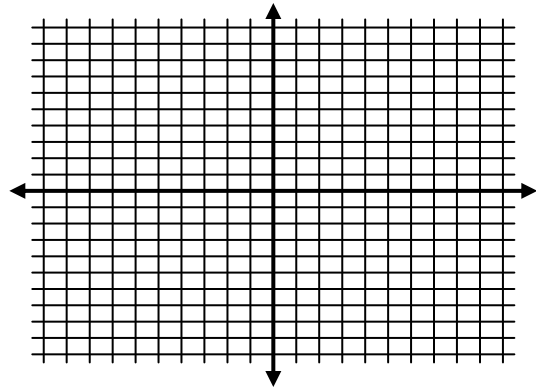
- Be able to solve an equation by graphing.

Solve the following quadratic equations by graphing.

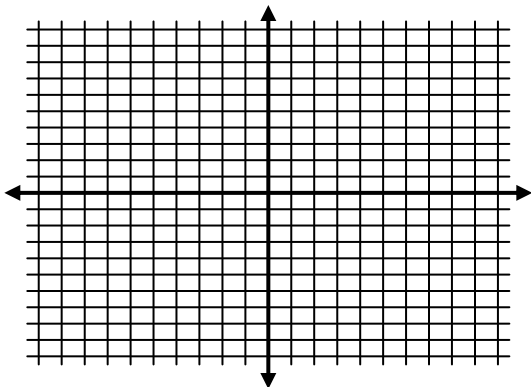
Ex: $x^2 - 5x + 4 = 0$



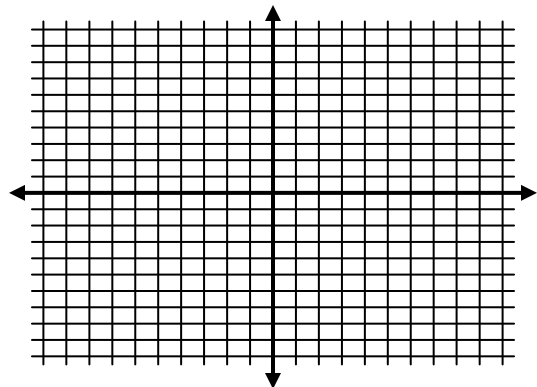
Ex: $2x^2 + x = 3$



Ex: $\frac{1}{2}x^2 + 2x = 6$



Ex: $x^2 - 5x + 7 = 0$



- Be able to approximate zeros of a function to the nearest tenth by making a table.

Approximate the zeros of the function to the nearest tenth.

Ex: $f(x) = x^2 + 4x - 5$

Ex: $f(x) = -3x^2 + 8x - 2$

10.4: Use Square Roots to Solve Quadratic Equations:

- Be able to solve a quadratic equation using square roots

Solve the following quadratic equations.

Ex: $4x^2 - 400 = 0$

Ex: $3z^2 - 18 = -18$

Ex: $3x^2 - 35 = 45 - 2x^2$

Ex: $11\left(\frac{w-7}{2}\right)^2 - 20 = 101$

10.6: Solve Quadratic Equations by the Quadratic Formula:

- Be able to solve quadratic equations by using the quadratic formula

Solve:

Ex: $x^2 + 5x - 104 = 0$

Ex: $4t^2 - 3t = 5 - 3t^2$

Ex: $x^2 - 8x = -16$

Ex: $(x + 13)^2 = 25$

10.7: Interpret the Discriminant:

- Be able to identify the value of the discriminant and use it to determine the number of solutions to a quadratic equation.

Tell whether the equation has *two solutions*, *one solution*, or *no solution*.

Ex: $x^2 + x + 1 = 0$

Ex: $-2x^2 + 8x - 4 = 0$

Ex: $-3g^2 - 4g = \frac{4}{3}$

Ex: $10 = x^2 - 5x$