Coreq Support for Section 4.1

Topic 1: Graphing Transformations of the Square Function
(Video: Quadratic Functions and Their Graphs 0:00 – 20:35)

In section 3.4, we graphed transformations of eight basic functions. In this section, we will focus on graphing functions that are transformations of the square function, $f(x) = x^2$.

To graph $y = x^2$, we can make a table of values and use those points to draw the graph.

$$y = x^2$$

If $x = -3$, then $y = (-3)^2$, or 9.

If $x = -2$, then $y = (-2)^2$, or 4.
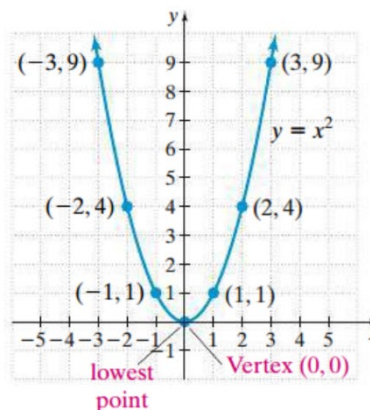
If $x = -1$, then $y = (-1)^2$, or 1.

If $x = 0$, then $y = 0^2$, or 0.

If $x = 1$, then $y = 1^2$, or 1.

If $x = 2$, then $y = 2^2$, or 4.

If $x = 3$, then $y = 3^2$, or 9.

x	y
-3	9
-2	4
-1	1
0	0
1	1
2	4
3	9

This curve is called a **parabola**. The lowest point on a parabola opening upward is called the **vertex**. The graph of a parabola is symmetric about the vertical line that passes through its vertex. The axis of symmetry for the graph of $y = x^2$ is the y-axis, or the line $x = 0$.

Topic 2: Evaluating Functions for Given Inputs

Topic 3: Solving Quadratic Equations

Recall that in section 1.4, we learned three methods of solving a quadratic equation: factoring, using the square root property, and using the quadratic formula.