

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

### Section 9.3 Graphing Quadratic Functions

Assignment: quadratic function in standard form:

parabola: The graph of a quadratic function. In the shape of a U

leading coefficient (a):

if a is positive The U will face up

if a is negative The U will face down



vertex: The highest/lowest point of the U

x-coordinate of the vertex: Formula:  $x = -\frac{b}{2a}$

axis of symmetry: A vertical line that divides the U into two equal parts

Examples:

1. Sketch the graph of  $y = x^2 - 4x + 2$

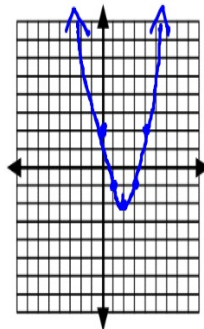
a. Find the x-coordinate of the vertex.

$$x = \frac{-(-4)}{2(1)} = x = \frac{4}{2} = 2$$

b. Make a table of values.

x	$x^2 - 4x + 2$	y
0	$0 - 0 + 2$	2
1	$1 - 4 + 2$	-1
2	$4 - 8 + 2$	-2
3	$9 - 12 + 2$	-1
4	$16 - 16 + 2$	2

c. Plot the points and sketch the graph.



2. Sketch the graph of  $y = -2x^2 - x + 1$

a. Find the x-coordinate of the vertex.

$a = -2$   $b = -1$   $c = 1$

$-\frac{b}{2a} = x = \frac{1}{2(-2)} = x = \frac{1}{-4}$

b. Make a table of values.

X	$-2x^2 - x + 1$	y
-2	$-8 + 2 + 1$	-5
-1	$-2 + 1 + 1$	0
$-\frac{1}{4}$	$-\frac{1}{8} + \frac{1}{4} + 1$	$\frac{7}{8}$
0	$0 - 0 + 1$	1
1	$-2 - 1 + 1$	-2

$V = -\frac{1}{4}$

c. Plot the points and sketch the graph.

