

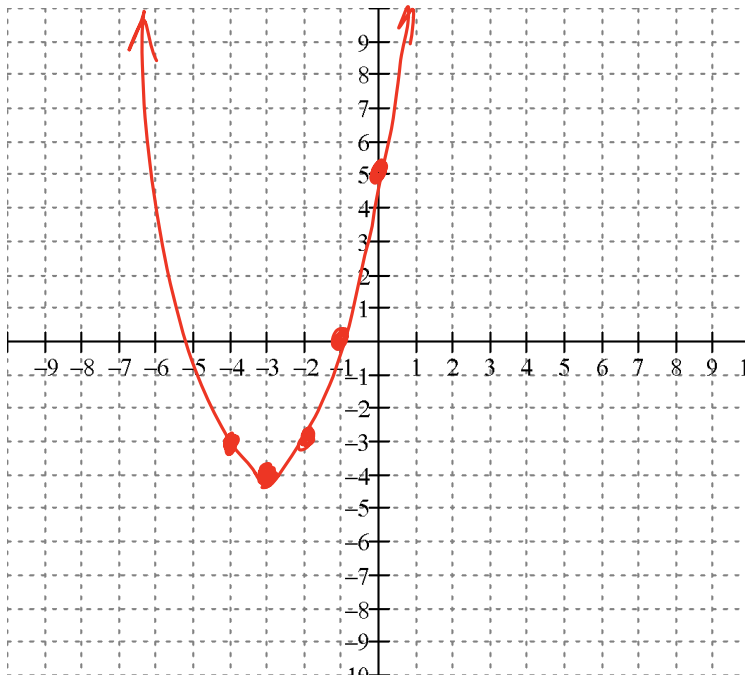
Quadratic Functions in Standard Form

The standard form of a quadratic function is:

$$f(x) = Ax^2 + Bx + C$$

e.g. $3x^2 - 2x + 1$

Ex. #1: Use a table of values to sketch the graph of $y = x^2 + 6x + 5$ and answer the following questions.



Vertex: $(-3, -4)$

Axis of symmetry: $x = -3$

Direction of Opening: \cup

Max or Min: $\textcircled{\text{Min}}$

Domain: $\{x \mid x \in \mathbb{R}\}$

Range: $\{y \mid y \geq -4, y \in \mathbb{R}\}$

x	$y = x^2 + 6x + 5$
0	5
1	12
-1	0
-2	-3
-3	-4
-4	-3

Vertex:

$$x = \frac{-b}{2a}$$

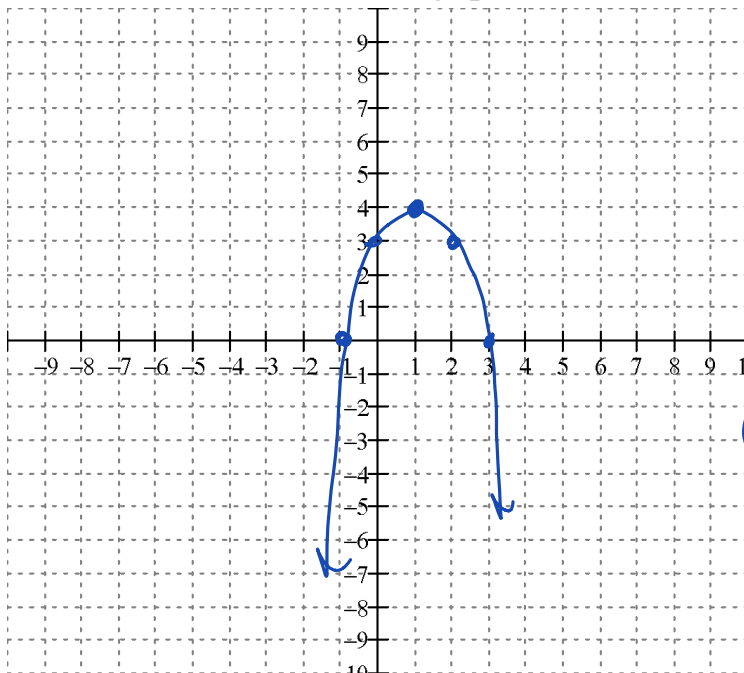
Ex. #2: Which functions are quadratic?

(a) $y = (x - 2)(2x + 5)$

$\rightarrow = 2x^2 + 5x - 4x - 10$
 $\rightarrow = 2x^2 + x - 10$

(b) $f(x) = 2x - 3$
line

Ex. #3: Use a graphing calculator to sketch the graph of $y = -x^2 + 2x + 3$ and answer the following questions.



Vertex: (1, 4)

Axis of symmetry: x = 1

Direction of Opening: down

Max or Min: @ y = 4

Domain: {x | x ∈ ℝ}

Range: {y | y ≤ 4, y ∈ ℝ}

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