Section 4.2: Standard Form of a Quadratric Equation

Standard Form:

$y = ax^2 + bx + c$

Vertex Form:

$y = a(x-h)^2 + k$

Vertex: (h, k)

The graph of $y=ax^2+bx+c$

is a parabola

1) If a>0, the parabola opens up

2) If a<0, the parabola opens down

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

3) The x-coordinate of the vertex is given by $-\frac{b}{2a}$

3) The axis of symmetry is given by $x = -\frac{b}{2a}$

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

Graph $y = x^2 + 4x + 1$

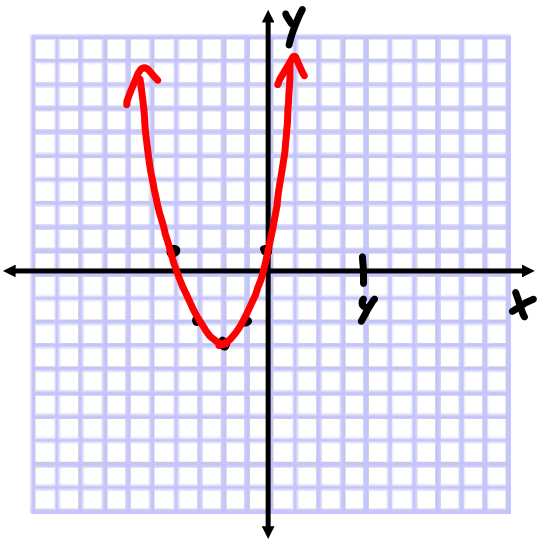
Identify the vertex, the axis of symmetry, the maximum or minimum value, and the range of the parabola.

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

↑ x-coordinate of vertex

Vertex

x	y
-2	-3



Standard width

Vertex: $(-2, -3)$

Axis of Sym: $x = -2$

Min. Value is -3

Range: $y \geq -3$

Ex: Write in Vertex Form. Then Graph the function.

$$y = 2x^2 + 3x - 1$$