

Vertex Form of a Parabola

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

Vertex (h,k)

How would you find the vertex of an equation?

If its in Vertex Form:

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

The vertex is (h, k)

if +: opens up
if -: opens down

x = opposite sign

y = constant

Convert to Vertex Form:

1. $y = x^2 + 2x - 3$
 $a=1$ $b=2$ $c=-3$

Step 1: Find Vertex $(-1, -4)$
h k

Step 2: $a = 1$
x $h = -1$
y $k = -4$

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

Change It.. Keep It!

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

$$y = (-1)^2 + 2(-1) - 3 = 1 - 2 - 3 = -4$$

Step 3: Plug a, h, and k into vertex form.

$$f(x) = (x - -1)^2 + -4$$
$$f(x) = (x + 1)^2 - 4$$