

Standard Form

$$f(x) = ax^2 + bx + c$$

Steps

1. Find a, b, c
2. Plug in a & b into

$$x = \frac{-b}{2a}$$
} this will give you the x part of your vertex
3. Plug " x " into the equation to find " y ".

Ex $y = 3x^2 + 18x + 31$
 $a = 3 \quad b = 18 \quad c = 31$

$$x = \frac{-b}{2a} = \frac{-18}{2(3)} = \frac{-18}{6} = -3$$

$$y = 3(-3)^2 + 18(-3) + 31 = 4$$

vertex: $(-3, 4)$

Ex $y = -x^2 + 2x + 3$
 $a = -1 \quad b = 2 \quad c = 3$

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

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

$(1, 4)$

Ex vertex
 $(-1, 3)$