

What you will learn about:
Graphing in Vertex form

Vertex Form

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

V (h, k)

Axis of Sym

$$X = h$$

$a > 0$ opens up
minimum

$a < 0$ opens down
maximum

y-intercept

$$\text{Let } x = 0$$

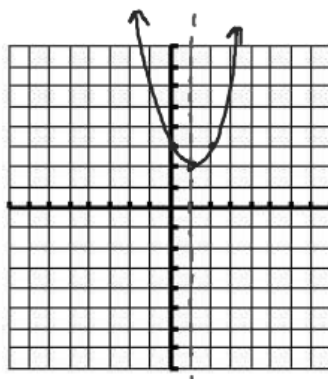
$$y = (x - 1)^2 + 2$$

Vertex: (1, 2)

Axis of Symmetry X = 1

Maximum or Minimum?

y-Intercept (0, 3)



$$\begin{aligned} y &= (0 - 1)^2 + 2 \\ &= (-1)^2 + 2 \\ &= 1 + 2 \\ &= 3 \end{aligned}$$

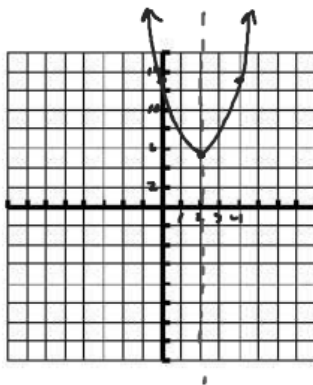
$$y = 2(x - 2)^2 + 5$$

Vertex: (2, 5)

Axis of Symmetry X = 2

Maximum or Minimum?

y-Intercept (0, 13)



$$\begin{aligned} y &= 2(0 - 2)^2 + 5 \\ &= 2(-2)^2 + 5 \\ &= 2(4) + 5 \\ &= 8 + 5 \\ &= 13 \end{aligned}$$

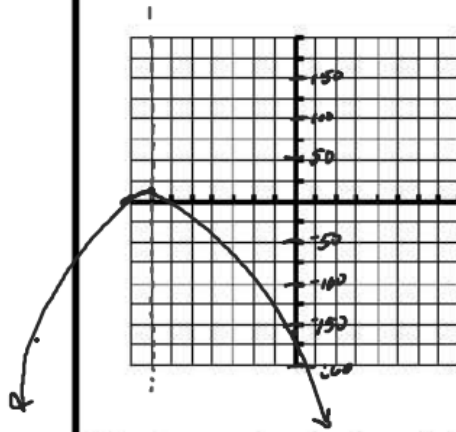
$$y = -3(x+7)^2 - 8$$

Vertex: $(-7, -8)$

Axis of Symmetry $X = -7$

Maximum or Minimum?

y-Intercept _____



$$\begin{aligned} y &= -3(0+7)^2 - 8 \\ &= -3(49) - 8 \\ &= -147 - 8 \\ &= -155 \end{aligned}$$

Write the equation of each parabola in vertex form.

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

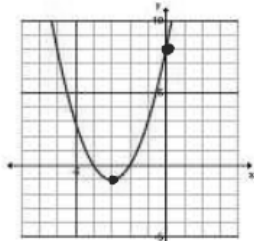
Step 1: Find Vertex

Step 2: Find another point on Curve

Step 3 Plug in values

for h, k, x, y
solve for a

Step 4 write equation
with a, h, k



$V(-3, -1), (0, 8)$
 $h \quad k \quad x \quad y$

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

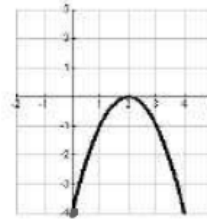
$$8 = a(0+3)^2 - 1$$

$$8 = 9a - 1$$

$$9 = 9a$$

$$a = 1$$

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



$V(2, 0), (0, -4)$
 $h \quad k \quad x \quad y$

$$-4 = a(0-2)^2 + 0$$

$$-4 = a(-2)^2$$

$$-4 = 4a$$

$$a = -1$$

$$y = -(x-2)^2$$