

STANDARD EQUATION OF A PARABOLA: Vertex (h, k)

EQUATION

FOCUS

DIRECTRIX

$$y - k = \frac{1}{4p}(x - h)^2$$

$$(h, k + p)$$

$$y = k - p$$

$$x - h = \frac{1}{4p}(y - k)^2$$

$$(h + p, k)$$

$$x = h - p$$

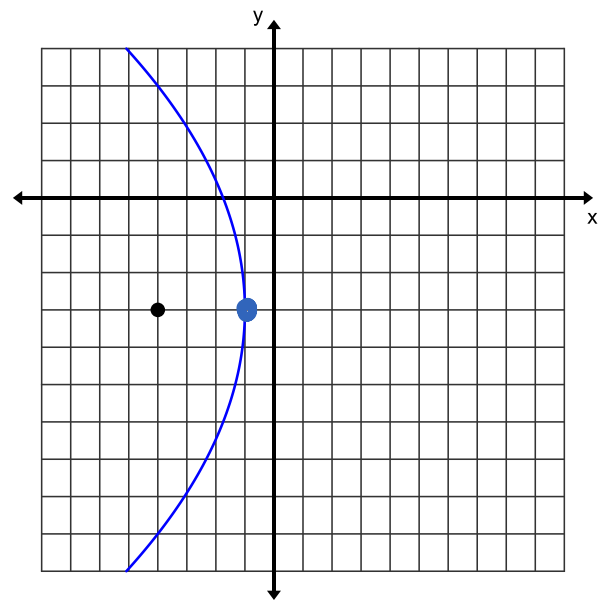
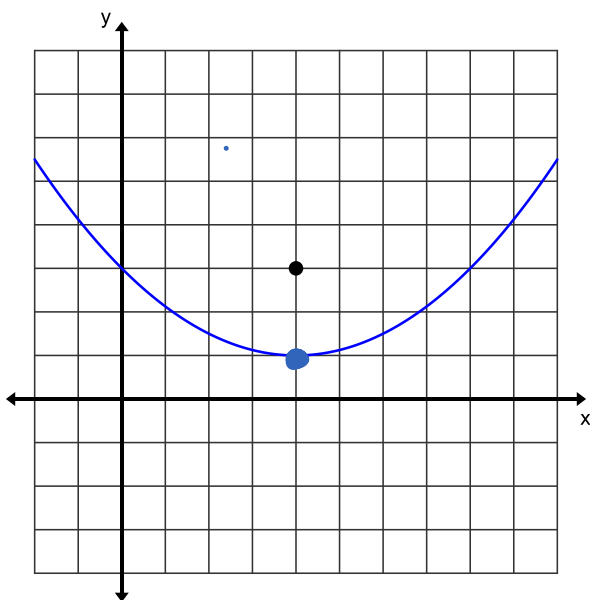
Given the following graph, find the standard equation of the parabola.

1.) Vertex $(4, 1)$ $p = 2$

$$y - 1 = \frac{1}{8}(x - 4)^2$$

2.) Vertex $(-1, -3)$ $p = -3$

$$x + 1 = \frac{1}{-12}(y + 3)^2$$



Using the given information, write the standard equation of the parabola.

3.) vertex: $(-2, 1)$

Focus: $(-3, 1)$

$p = -1$

$$x + 2 = \frac{1}{-4}(y - 1)^2$$

4.) vertex: $(0, 1)$

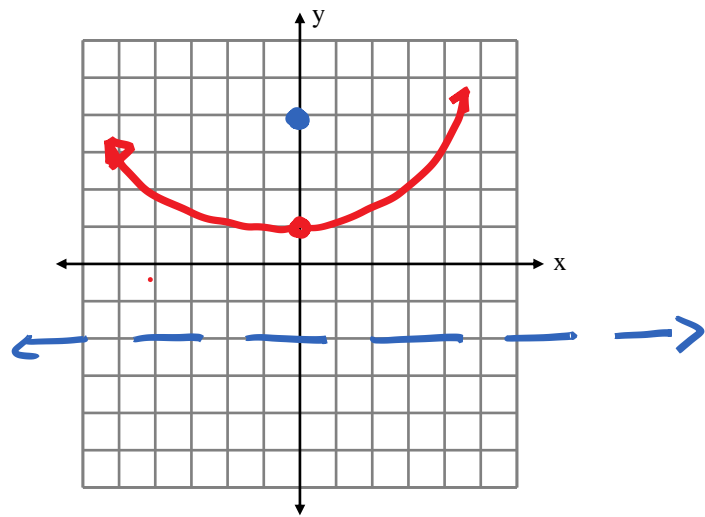
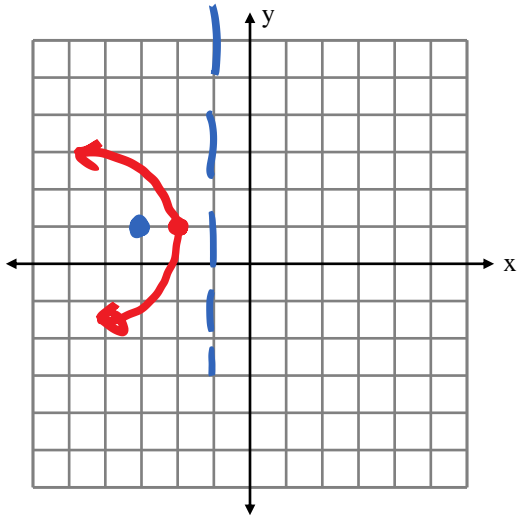
directrix: $y = -2$

$p = 3$

$$y - 1 = \frac{1}{12}(x - 0)^2$$

$$y - 1 = \frac{1}{12}x^2$$

or $y = \frac{1}{12}x^2 + 1$



Graph the equation and identify the vertex, focus and directrix of the parabola.

$$5.) \frac{(y-1)^2}{4} = 4(x-3)$$

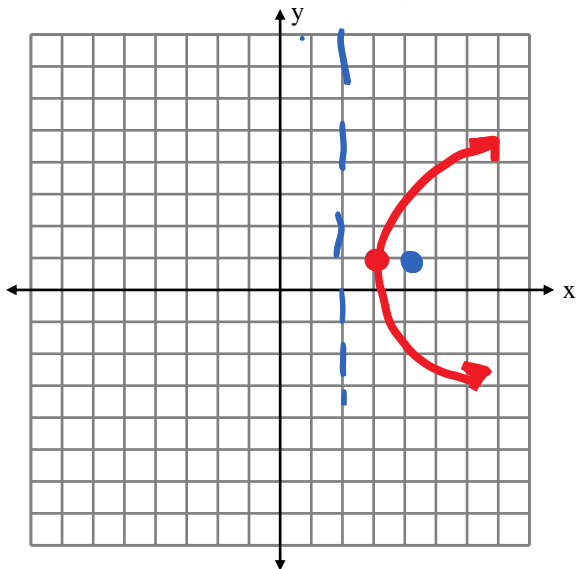
$$\frac{1}{4}(y-1)^2 = x-3$$

Vertex: (3, 1)

p=1

Focus: (4, 1)

Directrix: x=2



$$6.) \frac{-8(y-3)}{-8} = \frac{(x+4)^2}{-8}$$

$$y-3 = \frac{1}{-8}(x+4)^2$$

Vertex: (-4, 3)

p=-2

Focus: (-4, 1)

Directrix: y=5

