

1

Parabola: is the set of all points that are equidistant
from a point (called the focus) and a line (called the directrix).

The standard form of the equation of a parabola with vertex at $(0,0)$.

Equation	Focus	Directrix
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$y = \frac{1}{4p}x^2$	$(0, p)$	$y = -p$
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$x = \frac{1}{4p}y^2$	$(p, 0)$	$x = -p$
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Given the following graph, find the standard equation of the parabola.

1.) Focus: $(1, 0)$

Directrix: $x = -1$

$p = 1$

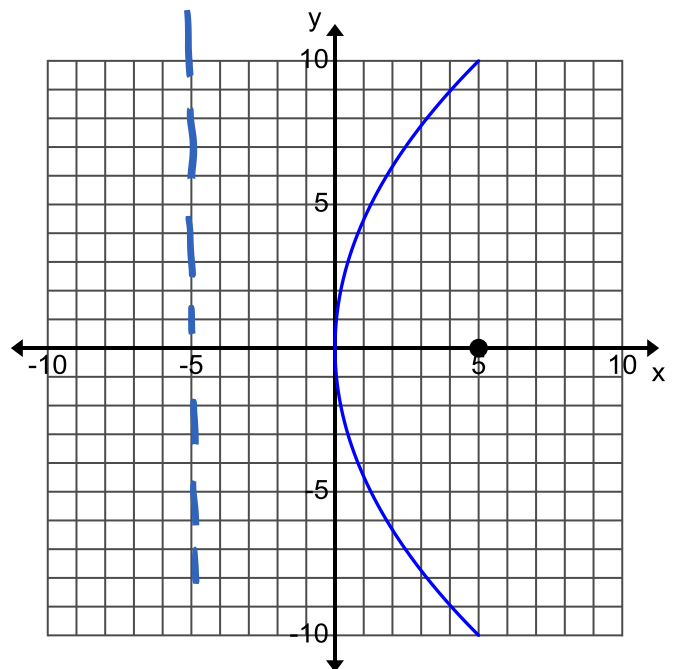
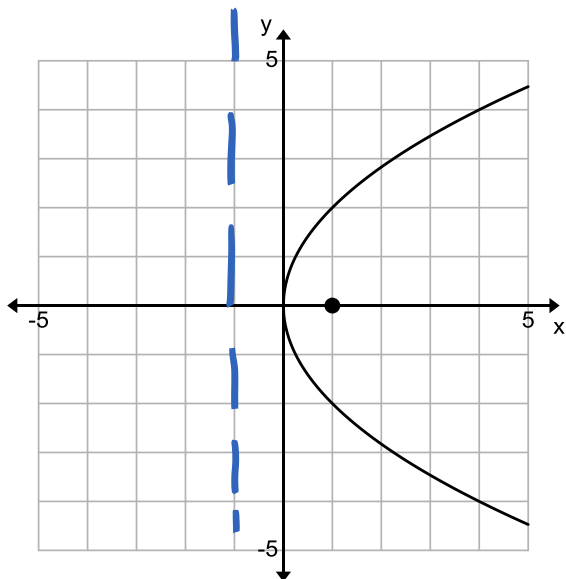
$x = \frac{1}{4}y^2$

2.) Focus: $(5, 0)$

Directrix: $x = -5$

$p = 5$

$x = \frac{1}{20}y^2$



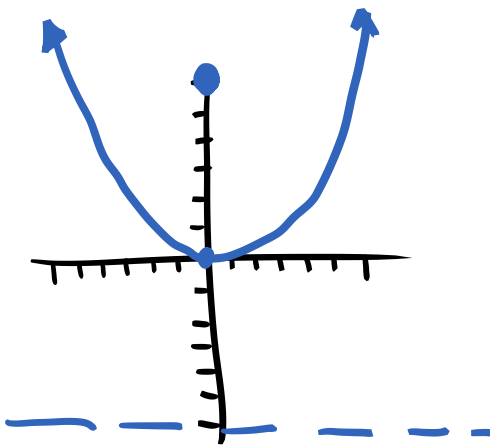
Using the given information, write the standard equation of the parabola.

3.) Vertex: $(0,0)$, focus: $(0,6)$

Directrix: $y = -6$

$$p = 6$$

$$y = \frac{1}{24}x^2$$

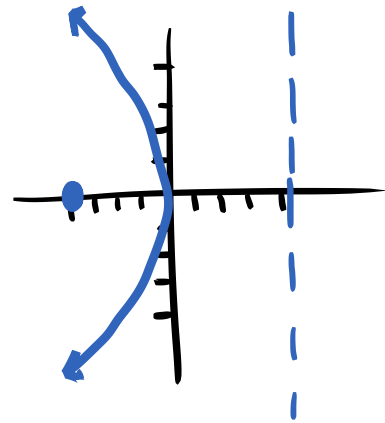


4.) Vertex: $(0,0)$, directrix: $x = 4$

Focus: $(-4,0)$

$$p = -4$$

$$x = -\frac{1}{16}y^2$$

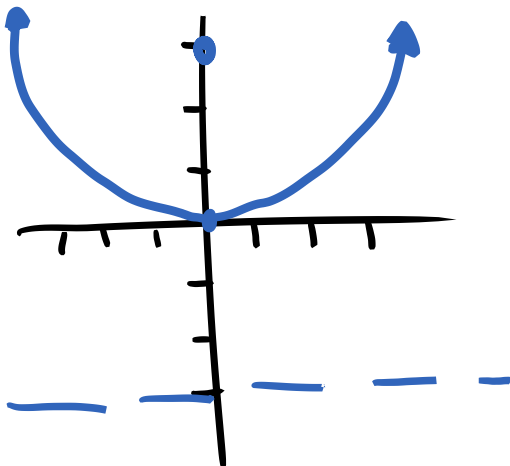


5.) Vertex: $(0,0)$, directrix: $y = -3$

Focus: $(0,3)$

$$p = 3$$

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



Sketch a graph of the equation and identify the focus and directrix of the parabola.

6.) $y^2 = -16x$
 $\frac{1}{-16} \quad -16$

$$\frac{1}{-16} y^2 = x$$

$p = -4$

Focus: $(-4, 0)$

Directrix: $x = 4$

7.) $x^2 = 4y$
 $\frac{1}{4} \quad \frac{1}{4}$

$$y = \frac{1}{4} x^2$$

$p = 1$

Focus: $(0, 1)$

Directrix: $y = -1$

