



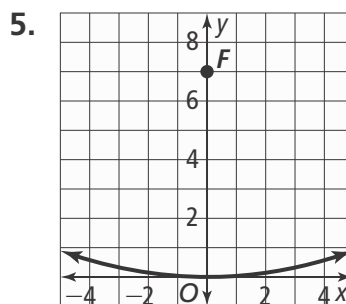
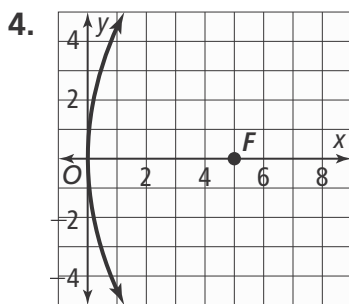
9-1 Additional Practice

Parabolas

Write an equation for a parabola given the focus and directrix.

1. focus $(0, 4)$ and directrix $y = -4$
2. focus $(3, 0)$ and directrix $x = -3$
3. A parabola has a focus of $(-2, 0)$ and directrix at $x = 2$.
 - a. What is the vertex of the parabola?
 - b. Is the equation in the form $y = ax^2$ or $x = ay^2$?
 - c. What is the focal length?
 - d. What is the equation of the parabola?

What is the equation of each of the parabolas shown?



6. A TV satellite dish has the shape of a parabola modeled by the equation $x = \frac{1}{120}y^2$. The satellite dish has a sensor at its focus. Using the graph of the equation and assuming the base of the dish, or vertex, is positioned at the point $(0, 0)$, at what coordinates would the sensor be placed?
7. Complete the square to identify the vertex, focus, and directrix of the parabola with the equation $0 = -y + x^2 - 6x + 2$.
8. What is the value of c for the parabola $x = \frac{1}{10}(y + 6)^2 + 2$? Explain.
9. The midpoint of a pipe with a diameter of 0.5 in. is located 10 in. from a mirror with a parabolic cross section used as a solar collector. The midpoint of the pipe is at the focus of the parabola. Write an equation to model the cross section of the mirror.



9-1 Additional Practice

Parabolas

Write an equation for a parabola given the focus and directrix.

1. focus (0, 4) and directrix $y = -4$

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

2. focus (3, 0) and directrix $x = -3$

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

3. A parabola has a focus of $(-2, 0)$ and directrix at $x = 2$.

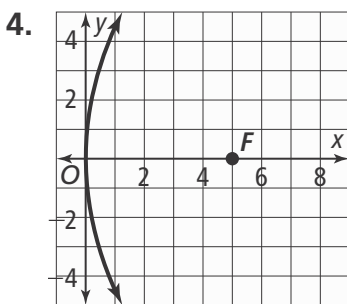
a. What is the vertex of the parabola? $(0, 0)$

b. Is the equation in the form $y = ax^2$ or $x = ay^2$? $x = ay^2$

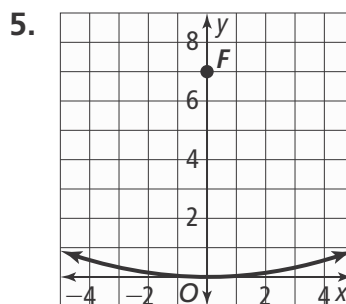
c. What is the focal length? 2

d. What is the equation of the parabola? $x = -\frac{1}{8}y^2$

What is the equation of each of the parabolas shown?



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



$$y = \frac{1}{28}x^2$$

6. A TV satellite dish has the shape of a parabola modeled by the equation $x = \frac{1}{120}y^2$. The satellite dish has a sensor at its focus. Using the graph of the equation and assuming the base of the dish, or vertex, is positioned at the point $(0, 0)$, at what coordinates would the sensor be placed?

$$(30, 0)$$

7. Complete the square to identify the vertex, focus, and directrix of the parabola with the equation $0 = -y + x^2 - 6x + 2$.

$$\text{vertex: } (3, -7); \text{ focus: } (3, -6.75); \text{ directrix: } y = -7.25$$

8. What is the value of c for the parabola $x = \frac{1}{10}(y + 6)^2 + 2$? Explain.

$$\text{The value of } c \text{ is } 2.5 \text{ because } \frac{1}{4c} = \frac{1}{10} \text{ and } 4 \times 2.5 = 10.$$

9. The midpoint of a pipe with a diameter of 0.5 in. is located 10 in. from a mirror with a parabolic cross section used as a solar collector. The midpoint of the pipe is at the focus of the parabola. Write an equation to model the cross section of the mirror.

$$y = \frac{1}{40}x^2$$