

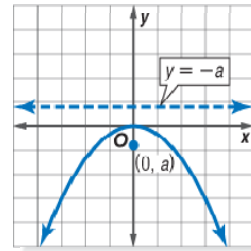
Lesson 13-2

Example 1

Find the focus and directrix of the equation $x^2 = -3y$.

Solution

$$\begin{aligned}x^2 &= -3y \\x^2 &= 4ay \\4ay &= -3y \\4a &= -3 \\a &= -\frac{3}{4} \\x^2 &= 4\left(-\frac{3}{4}\right)y\end{aligned}$$



Because a is negative, the parabola opens downward. The focus is located at $(0, a)$, so the focus is $0, -\frac{3}{4}$. The directrix is the line $y = -a$, so the directrix is $y = -1 - \frac{3}{4}$ or $y = \frac{3}{4}$.

Example 2

SATELLITE COMMUNICATIONS A parabolic satellite dish directs all incoming signals to a receiver. The receiver is located at the vertex which is at the origin and the focus is at $(0, 3)$. Find the simple equation for the parabola.

Solution

$$\begin{aligned}x^2 &= 4ay \\a &= 3 \\x^2 &= 4(3)y \\x^2 &= 12y\end{aligned}$$

The equation is $x^2 = 12y$.

