Student: Cole Lamers **Date:** 07/04/19	**Instructor:** Kelly Galarneau **Course:** CA&T Internet (70263) Galarneau	**Assignment:** 2.2, 10.2 Circle and The Parabola

Find the focus and directrix of the parabola with the equation $12x^2 = -14y$. Then graph the parabola.

The standard form of the equations of a parabola with vertex at the origin are $y^2 = 4ax$, $y^2 = -4ax$, $x^2 = 4ay$, or $x^2 = -4ay$.

For the equation $y^2 = 4ax$ or $y^2 = -4ax$, the focus is on the x-axis, which is the axis of symmetry. For the equation $x^2 = 4ay$ or $x^2 = -4ay$, the focus is on the y-axis, which is the axis of symmetry.

Write the equation $12x^2 = -14y$ in the standard form $x^2 = -4ay$.

$$12x^2 = -14y$$
$$x^2 = -\frac{7}{6}y \qquad \text{Divide both sides by 12.}$$

Equate the coefficients of y by comparing with $x^2 = -4ay$. Determine the value of a.

$$-4a = -\frac{7}{6}$$
$$a = \frac{7}{24} \qquad \text{Divide both sides by } -4.$$

The focus of a parabola with an equation of the form $x^2 = -4ay$ is at the point $(0, -a)$.

The focus of the parabola $12x^2 = -14y$ is $\left(0, -\frac{7}{24}\right)$.

The directrix of a parabola with an equation of the form $x^2 = -4ay$ has the form $y = a$.

The directrix of the parabola $12x^2 = -14y$ is $y = \frac{7}{24}$.

Because the equation of the parabola is of the form $x^2 = -4ay$ with $a > 0$, the parabola, with its y-axis symmetry, opens downward.

The graph of the parabola with the equation $12x^2 = -14y$ is shown to the right.