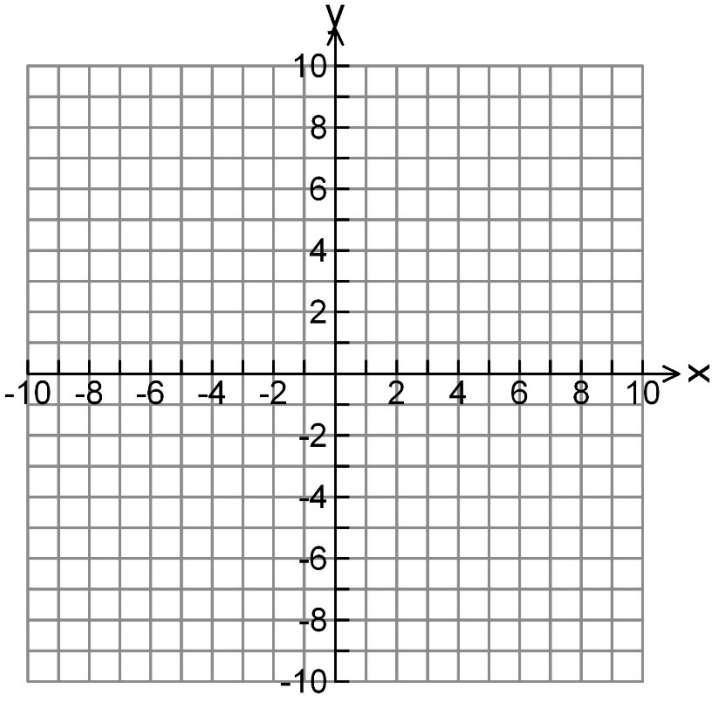
**Section 10.2: Ellipses**

**Video 1: Ellipses Centered at the Origin**

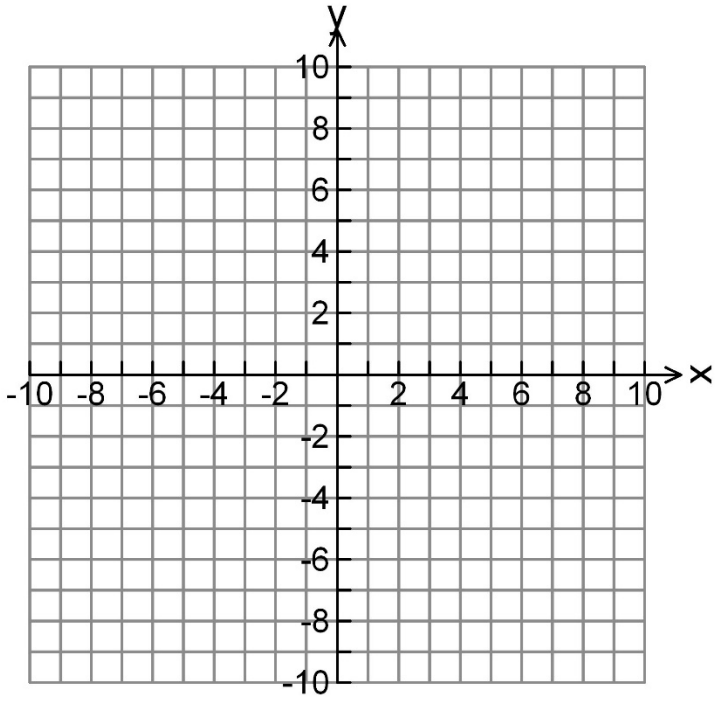
1) Graph the ellipse. Find the foci and list the domain/range.

$$9x^2 + 4y^2 = 36$$



2) Graph the ellipse. Find the foci and list the domain/range.

$$x^2 = 16 - 4y^2$$



**Video 2: Finding the Equation of an Ellipse Centered at the Origin**

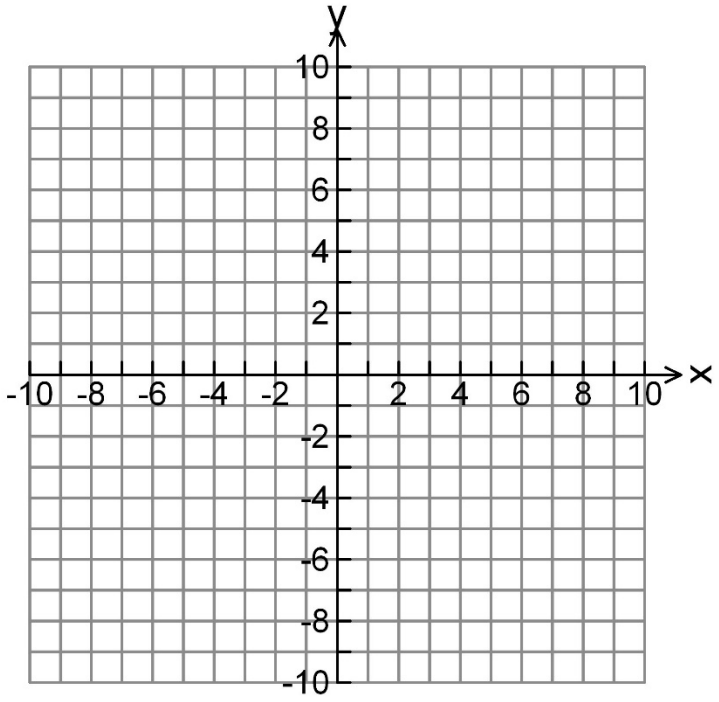
3) Find the equation of an ellipse that has a major axis with length 20 and foci at $(6,0)$ and $(-6,0)$.

4) Find the equation of an ellipse that has a minor axis with length 18 and foci at $(0,4)$ and $(0,-4)$.

**Video 3: Graphing a Half-Ellipse**

5) Graph. Find the foci and list the domain/range.

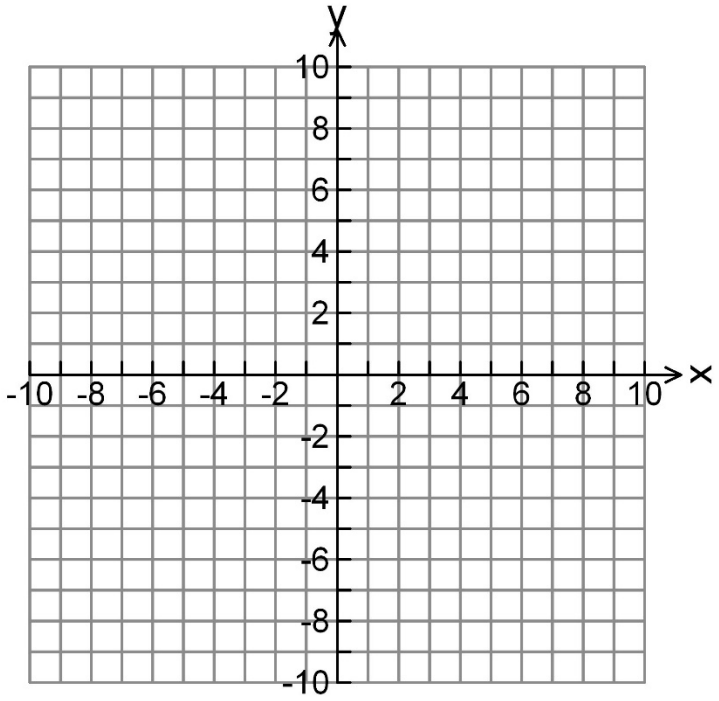
$$\frac{y}{2} = -\sqrt{1 - \frac{x^2}{25}}$$



**Video 4: Graph an Ellipse Translated Away from the Origin**

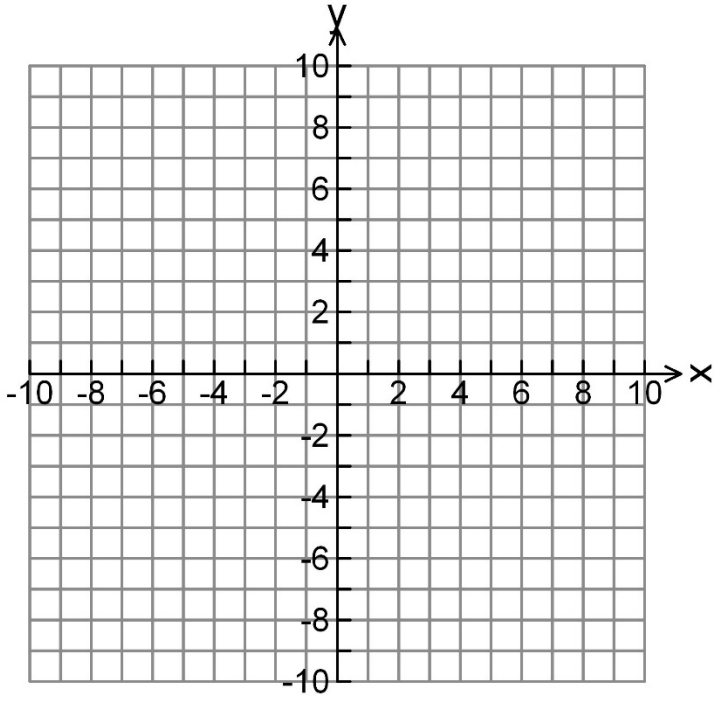
6) Graph the ellipse. Find the foci and list the domain/range.

$$\frac{(x-4)^2}{25}+\frac{(y+1)^2}{9}=1$$



7) Graph the ellipse. Find the foci and list the domain/range.

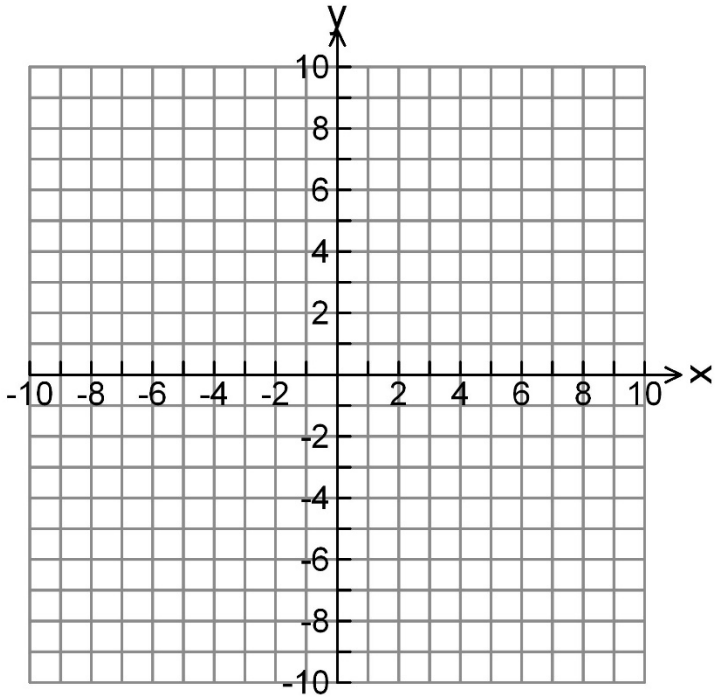
$$\frac{x^2}{4}+\frac{(y-3)^2}{36}=1$$



**Video 5: Rewriting the Equation of an Ellipse in Standard Form (Completing the Square)**

8) Graph the ellipse. Find the foci and list the domain/range.

$$9x^2 + 72x + 16y^2 - 128y = -256$$



**Video 6: Eccentricity**

The **eccentricity** of an ellipse is given by the formula $e = \frac{c}{a} = \frac{\sqrt{a^2 - b^2}}{a}$.

The eccentricity is always between 0 and 1. When *e* is close to 0, the graph is close to a circle.

9) Find the eccentricity of $\frac{x^2}{49} + \frac{y^2}{4} = 1$.

10) Find the eccentricity of $36(x-7)^2 + 25(y+2)^2 = 900$.