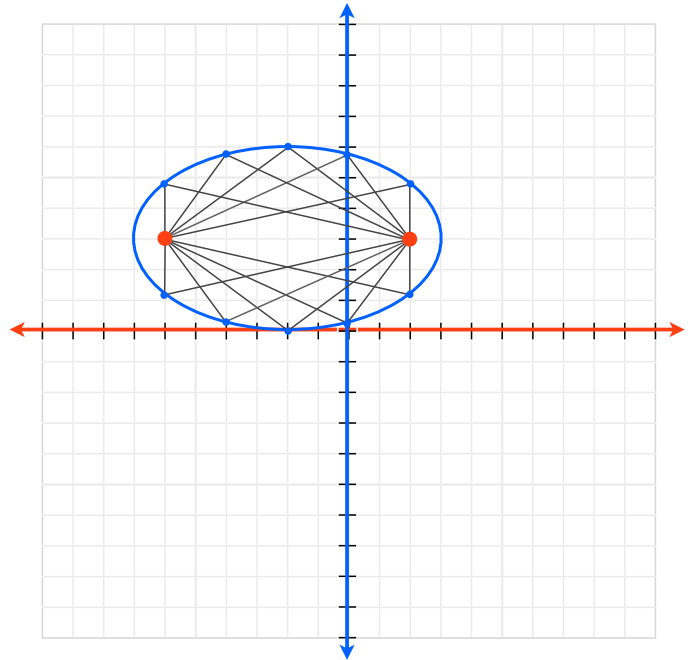


What is an **Ellipse**?

**Ellipse** - the set of points such that the sum of the distances from **two given points** stays the same.



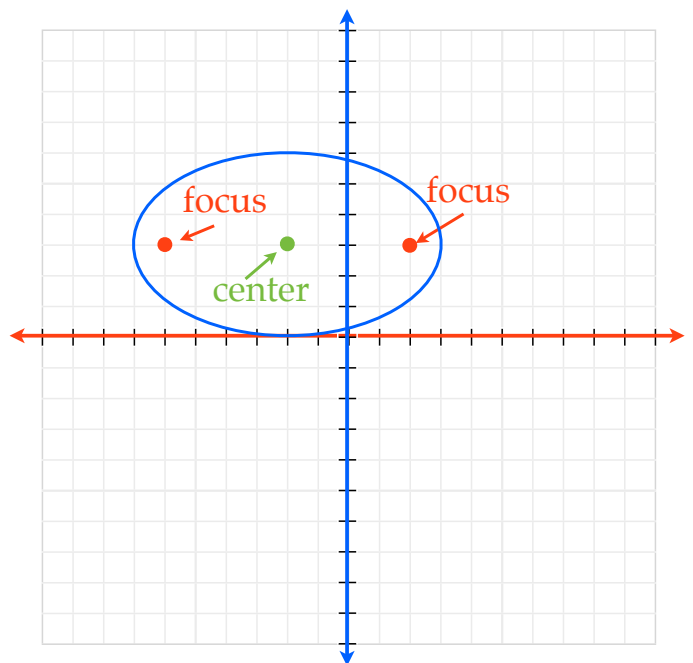
What is an **Ellipse**?

**Ellipse** - the set of points such that the sum of the distances from **two given points** stays the same.

The given points are **focus points**.

The plural of **focus** is **foci**.

The midpoint of the segment joining the two **foci** is the **center** of the ellipse.



## What is an Ellipse?

**Ellipse** - the set of points such that the sum of the distances from **two given points** stays the same.

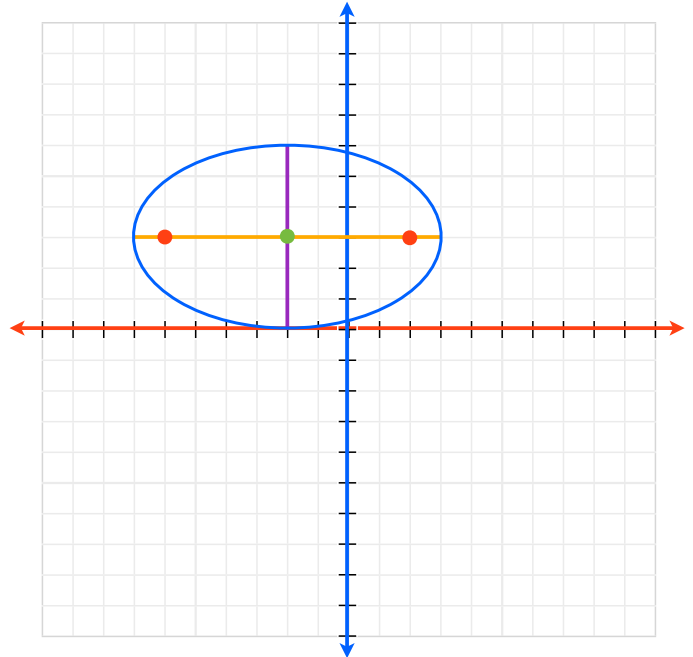
The given points are **focus points**.

The plural of **focus** is **foci**.

The midpoint of the segment joining the two foci is the **center** of the ellipse.

**Major Axis** - The axis of symmetry that is the longest.

**Minor Axis** - The axis of symmetry that is the shortest.



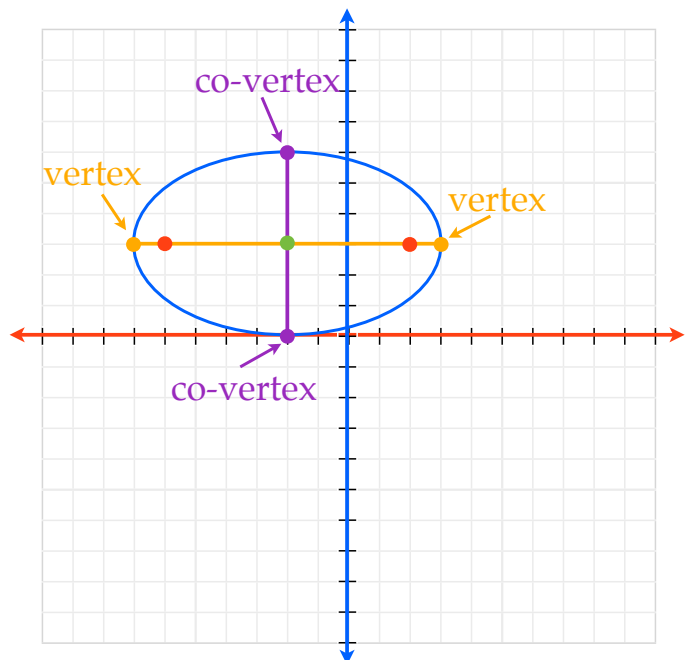
## What is an Ellipse?

**Vertices** - The endpoints of the major axis on the ellipse.

**Co-Vertices** - The endpoints of the minor axis on the ellipse.

**Major Axis** - The axis of symmetry that is the longest.

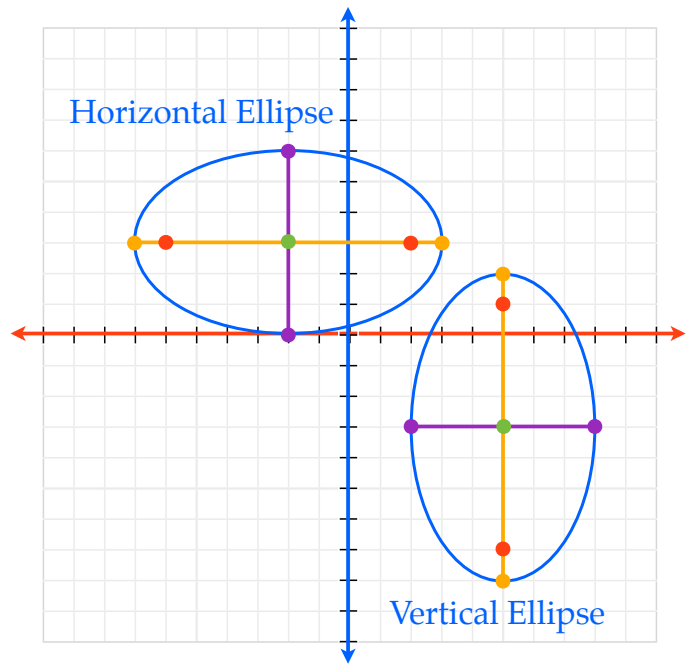
**Minor Axis** - The axis of symmetry that is the shortest.



What is an **Ellipse**?

**Horizontal Ellipse**  
if the **major axis** runs horizontally.

**Vertical Ellipse**  
if the **major axis** runs vertically.

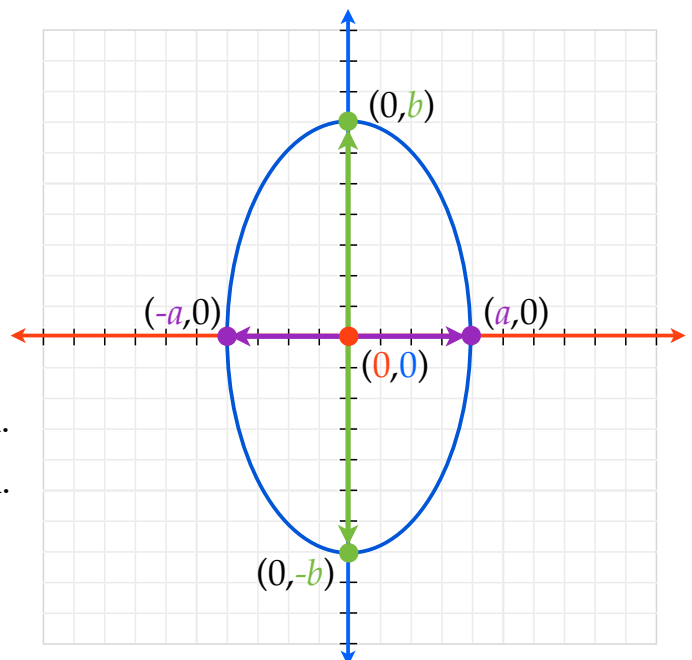


Equation of an **Ellipse**  
with **center**  $(0,0)$

$$\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$$

$a$  is the distance you travel in the  $x$ -direction.

$b$  is the distance you travel in the  $y$ -direction.

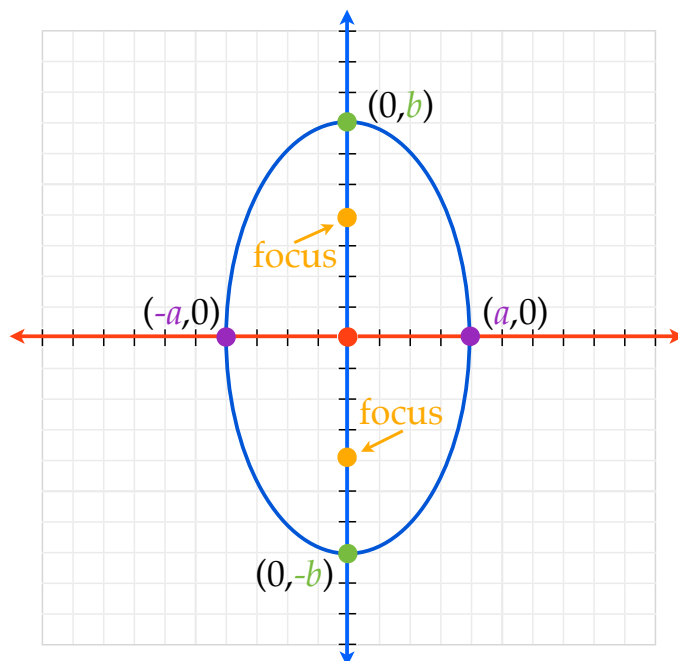


Equation of an Ellipse  
with center  $(0,0)$

$$\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$$

Foci:  $a^2 - b^2 = c^2$  Solve for  $c$   
 $b^2 - a^2 = c^2$

Travel  $c$  units from center along major axis to find foci



Equation of an Ellipse  
with center  $(0,0)$

$$a = ? \quad \frac{x^2}{a^2} + \frac{y^2}{b^2} = 1 \quad b = ?$$

Center

Horizontal/Vertical

Major Axis Length

Minor Axis Length

Vertices

Co-Vertices

Domain

Foci  $a^2 - b^2 = c^2$   $b^2 - a^2 = c^2$

Range

