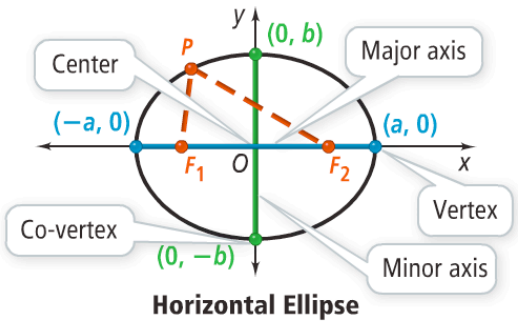
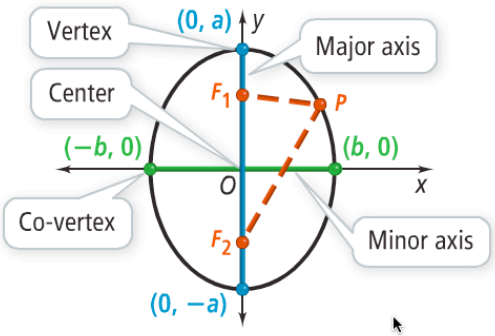
The **major axis** is the segment that contains the foci and has its endpoints on the ellipse. Its midpoint is the **center of the ellipse**. The **minor axis** is perpendicular to the major axis at the center. The **vertices of an ellipse** (singular: *vertex*) are the endpoints of the major axis. The **co-vertices of an ellipse** are the endpoints of the minor axis.



Horizontal Ellipse



Vertical Ellipse

take note

Key Concept Properties of Ellipses with Center (0, 0)

	Horizontal Ellipses	Vertical Ellipses
Standard Equation	$\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1, a > b > 0$	$\frac{x^2}{b^2} + \frac{y^2}{a^2} = 1, a > b > 0$
Major Axis	horizontal	vertical
Vertices	$(\pm a, 0)$	$(0, \pm a)$
Co-vertices	$(0, \pm b)$	$(\pm b, 0)$
Foci	$(\pm c, 0)$ on x-axis	$(0, \pm c)$ on y-axis

The length of the major axis is $2a$ and the length of the minor axis is $2b$.
For any point P on an ellipse, $PF_1 + PF_2 = 2a$.

take note

Summary Translating Horizontal Ellipses

Horizontal Ellipse	Center (0, 0)	Center (*h*, *k*)
Standard-Form Equation	$\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$	$\frac{(x-h)^2}{a^2} + \frac{(y-k)^2}{b^2} = 1$
Vertices	$(\pm a, 0)$	$(h \pm a, k)$
Co-vertices	$(0, \pm b)$	$(h, k \pm b)$
Foci	$(\pm c, 0)$	$(h \pm c, k)$
a, b, c relationship, $a > b > 0$	$c^2 = a^2 - b^2$	$c^2 = a^2 - b^2$