Alg 2B Ellipse Summary Fall 2017

Ellipse The set of all points P in a plane such that the sum of the distances from P to two fixed points F_1 and F_2 is a given constant.

Major Axis: The longer Axis. Contains the Foci.

Minor Axis: The shorter Axis. Perpendicular bisector of the Major Axis .

Vertices: Endpoints of the Major Axis and are equidistant from the center. Use the letter a.

Co-Vertices: Endpoints of the Minor Axis and are equidistant from the center. Use the letter b.

Foci: The two fixed points. Located on the Major Axis and are equidistant from the center. Use the letter c.

Standard Form for the equation of an Ellipse with center at $(0,0)$:

$a^2 > b^2$

Horizontal Major Axis

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

Vertices: $(\pm a, 0)$
Co-Vertices: $(0, \pm b)$
Foci: $(\pm c, 0)$
Major Axis length $= 2a$
Minor Axis length $= 2b$

Vertical Major Axis

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

Vertices: $(0, \pm a)$
Co-Vertices: $(\pm b, 0)$
Foci: $(0, \pm c)$
Major Axis length $= 2a$
Minor Axis length $= 2b$

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

Standard Form for the equation of an Ellipse with center at (h,k):

$a^2 > b^2$

Horizontal Major Axis

$$\frac{(x-h)^2}{a^2} + \frac{(y-k)^2}{b^2} = 1$$

Vertices: $(h \pm a, k)$
Co-Vertices: $(h, k \pm b)$
Foci: $(h \pm c, k)$
Major Axis length $= 2a$
Minor Axis length $= 2b$

Vertical Major Axis

$$\frac{(x-h)^2}{b^2} + \frac{(y-k)^2}{a^2} = 1$$

Vertices: $(h, k \pm a)$
Co-Vertices: $(h \pm b, k)$
Foci: $(h, k \pm c)$
Major Axis length $= 2a$
Minor Axis length $= 2b$