## Pre-Calculus

Notes 7.3

## ELLIPSES

You should be able to:

- Put an equation in standard form of an ellipse
- State the important info (center, vertices, foci, length the of major and minor axes )
- Sketch a graph

An ELLIPSE is the set of all points in a plane the sum of whose distance from two set points $F_{1}$ and $F_{2}$ is a constant. These points are called the foci (plural of focus).


|  | Horizontal | Vertical |
| :---: | :---: | :---: |
| Standard Form of <br> Parabola |  |  |
| Focal Axis |  |  |
| Foci |  |  |
| Vertices |  |  |
| Major Axis |  |  |
| Minor Axis |  |  |
| Pythagorean Relation |  |  |

Ex 1) Given: $4 x^{2}+9 y^{2}=36$
a) Put the standard Form
f) Sketch the graph
b) State the center $\qquad$
c) State the vertices $\qquad$
d) State the foci $\qquad$
e) State the length of the major and minor axes.

Ex 2) Given: $\frac{(x+5)^{2}}{9}+\frac{(y-2)^{2}}{49}=1$
a) State the center $\qquad$ e) Sketch the graph
b) State the vertices $\qquad$
c) State the foci $\qquad$
d) State the length of the major and minor axes.

Ex 3) Given: $3 x^{2}+5 y^{2}-12 x+30 y+42=0$
f) Sketch the graph
a) Put the standard Form
b) State the center $\qquad$
c) State the vertices $\qquad$
d) State the foci $\qquad$
e) State the length of the major and minor axes.

Ex 4) Given: $3 x^{2}+5 y^{2}-12 x+30 y+42=0$
a) Put the standard Form
b) State the center $\qquad$
c) State the vertices $\qquad$
d) State the foci $\qquad$
e) State the length of the major axis $\qquad$
f) State the length of the minor axes $\qquad$
Ex 5) Write the equation of the Ellipses with foci at $(0,-3)$ and $(0,3)$ and the length of the minor axes is 4 .

Ex 6) Write the standard conic form of the equation for the ellipse with vertices at $(-5,14)$ and $(-5,2)$ and a focus at $(-5,8 \pm 2 \sqrt{5})$

Ex 7) Write the standard conic form of the equation for the ellipse with foci at $(5,3)$ and $(-9,3)$ and the length of major axis is 20 .

