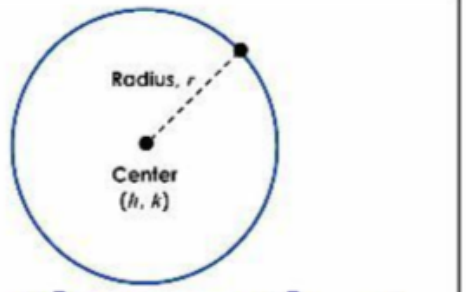
PreCalculus - Conic Sections

$$M = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$

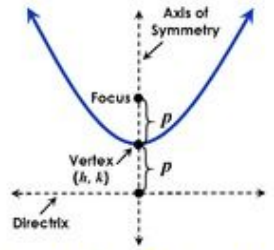
$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

CIRCLE



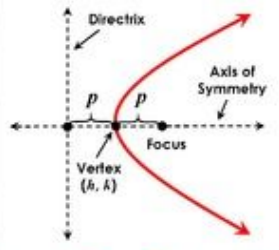
$$(x-h)^2 + (y-k)^2 = r^2$$

PARABOLA



$$(x-h)^2 = 4p(y-k)$$

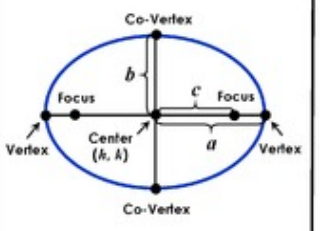
Opens UP if $p > 0$
Opens DOWN if $p < 0$



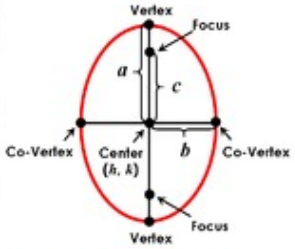
$$(y-k)^2 = 4p(x-h)$$

Opens RIGHT if $p > 0$
Opens LEFT if $p < 0$

ELLIPSE



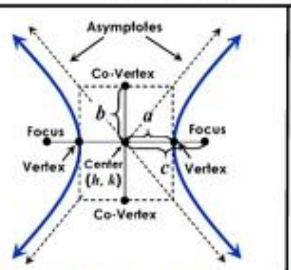
$$\frac{(x-h)^2}{a^2} + \frac{(y-k)^2}{b^2} = 1$$



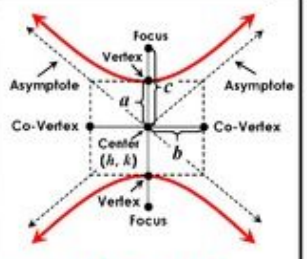
$$\frac{(x-h)^2}{b^2} + \frac{(y-k)^2}{a^2} = 1$$

FORMULA FOR C: $c^2 = a^2 - b^2$

HYPERBOLA



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



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

FORMULA FOR C: $c^2 = a^2 + b^2$

Systems:

Graph (find points of intersection), Substitution, or Combination/Elimination