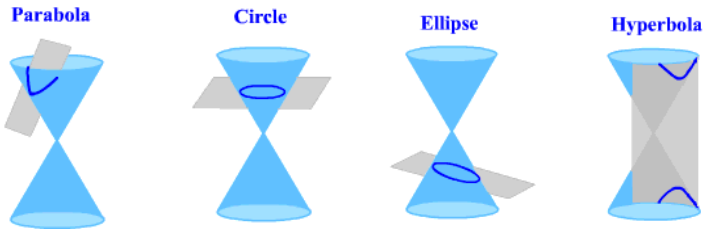
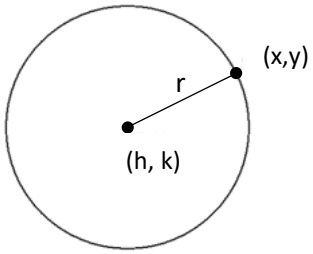
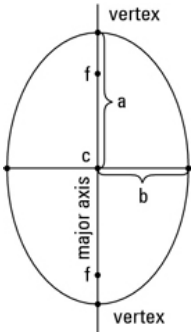
CONICS SECTIONS



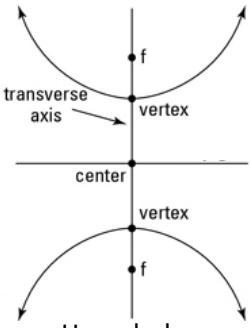


CIRCLE	$(x-h)^2+(y-k)^2=r^2$	Center: $(h\,,k)$ Radius: r

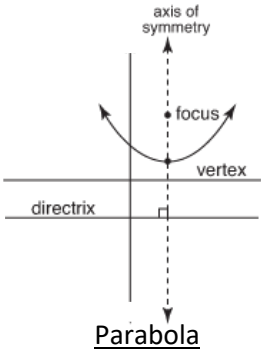
Vertically Oriented Conics



Ellipse



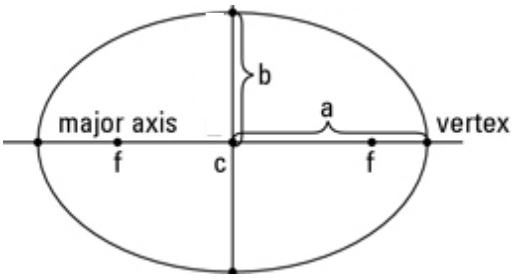
Hyperbola



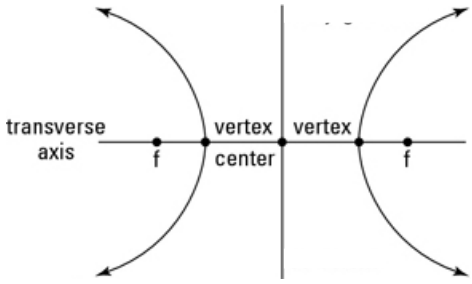
Parabola

ELLIPSE with *VERTICAL* Major Axis	$\frac{(x-h)^2}{b^2}+\frac{(y-k)^2}{a^2}=1\,,$ $a>b>0$ and $b^2=a^2-c^2$	Center: $(h\,,k)$ Foci: $(h\,,k\pm c)$ Vertices: $(h\,,k\pm a)$
HYPERBOLA with *VERTICAL* Transverse Axis	$\frac{(y-k)^2}{a^2}-\frac{(x-h)^2}{b^2}=1\,,$ $b^2=c^2-a^2$	Center: $(h\,,k)$ Foci: $(h\,,k\pm c)$ Vertices: $(h\,,k\pm a)$ Asymptotes: $y-k=\pm\frac{a}{b}(x-h)$
PARABOLA with *VERTICAL* Axis of Symmetry	$(x-h)^2=4a(y-k)$, $a>0$, opens up $a<0$, opens down	Center $(h\,,k)$ Focus: $(h\,,k+a)$ Directrix: $y=k-a$

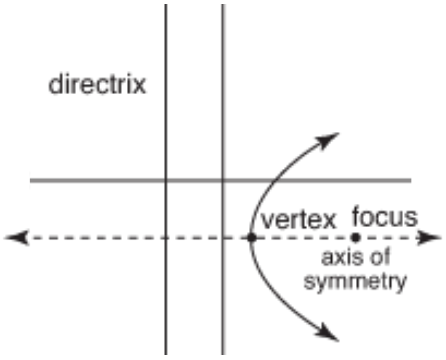
Horizontally Oriented Conics



Ellipse



Hyperbola



Parabola

ELLIPSE with *HORIZONTAL* Major Axis	$\frac{(x-h)^2}{a^2}+\frac{(y-k)^2}{b^2}=1$, $a>b>0$ and $b^2=a^2-c^2$	Center: $(h\,,k)$ Foci: $(h\pm c\,,k)$ Vertices: $(h\pm a\,,k)$
HYPERBOLA with *HORIZONTAL* Transverse Axis	$\frac{(x-h)^2}{a^2}-\frac{(y-k)^2}{b^2}=1$, $b^2=c^2-a^2$	Center: $(h\,,k)$ Foci: $(h\pm c\,,k)$ Vertices: $(h\pm a\,,k)$ Asymptotes: $y-k=\pm\frac{b}{a}(x-h)$
PARABOLA with *HORIZONTAL* Axis of Symmetry	$(y-k)^2=4a(x-h)$, $a>0$, opens right $a<0$, opens left	Center $(h\,,k)$ Focus: $(h+a\,,k)$ Directrix: $x=h-a$