Parabola:

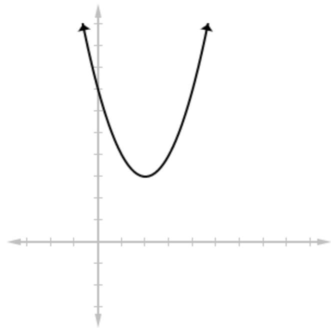
$(x-h)^2 = 4p(y-k)$

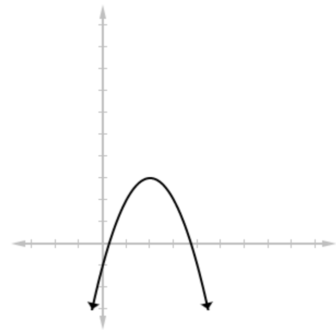
Vertex: $(h\,,k)$

Opens up or down

Focus: $(h\,,k+p)$

Line of Directrix: $y = k - p$





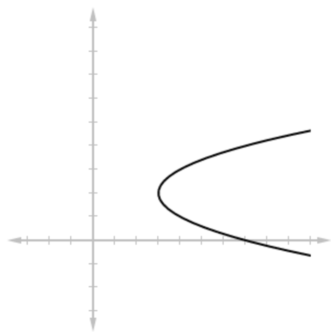
$(y-k)^2 = 4p(x-h)$

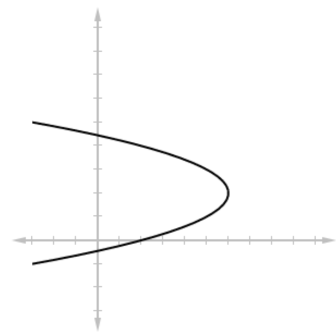
Opens left or right

Focus: $(h+p\,,k)$

Line of Directrix: $x = h - p$

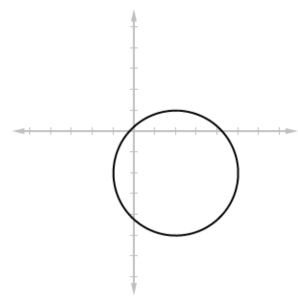
Vertex: $(h\,,k)$





Circle:

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



Ellipse:

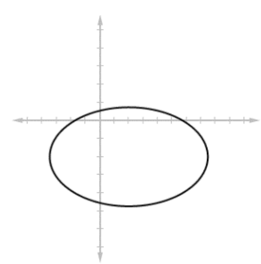
$$\frac{(x-h)^2}{a^2} + \frac{(y-k)^2}{b^2} = 1$$

Center: $(h\,,k)$ and $c = \sqrt{a^2 - b^2}$

Vertices: $(h-a\,,k)\,,(h+a\,,k)\,,(h\,,k-b)\,,(h\,,k+b)$

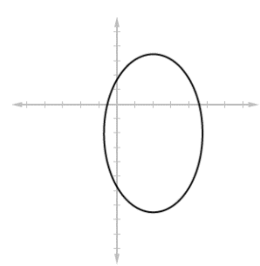
If $a > b$, then length of major axis is $2a$, and length of minor axis is $2b$,

and foci are $(h-c\,,k)$ and $(h+c\,,k)$.

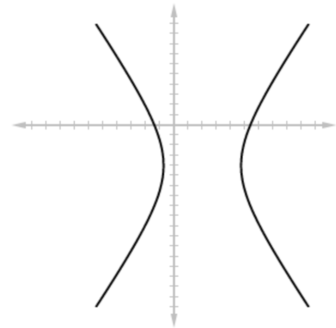


If $b > a$, then length of major axis is $2b$, and length of minor axis is $2a$,

and foci are $(h\,,k-c)$ and $(h\,,k+c)$.



Hyperbola:

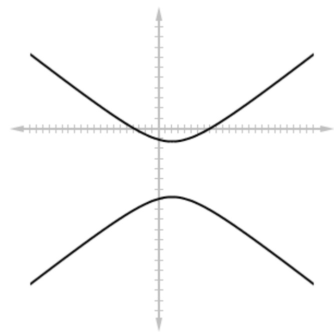


$$\frac{(x-h)^2}{a^2} - \frac{(y-k)^2}{b^2} = 1$$

Opens left and right

Vertices: $(h-a\,,k)\,,(h+a\,,k)$

Foci: $(h-a-c\,,k)\,,(h+a+c\,,k)$



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

Opens up and down

vertices: $(h\,,k-b)\,,(h\,,k+b)$

Foci: $(h\,,k-b-c)\,,(h\,,k+b+c)$

<u>They both have:</u>

Center: $(h\,,k)$ and $c = \sqrt{a^2+b^2}$

Equations of asymptotes: $y = \frac{b}{a}(x-h)+k$ and $y = -\frac{b}{a}(x-h)+k$