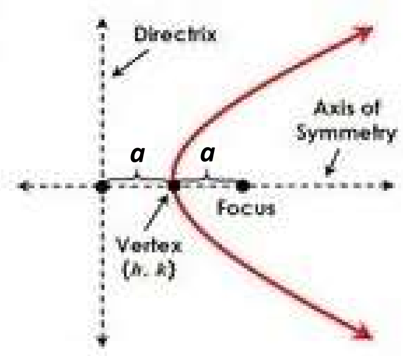
The Parabola: Only 1 term is being squared!

$(x-h)^2 = 4a(y-k)$ — The parabola opens up (a>0) or down (a<0) *

$(y-k)^2 = 4a(x-h)$ — The parabola opens right (a>0) or left (a<0) *

- The vertex is the point (h,k)
- The distance from the vertex to the focus and directrix is **a**
- The distance from the focus to each latus rectum is **2a**

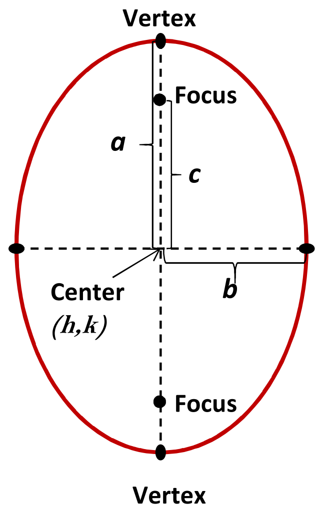


The Ellipse: Two squared terms being added! (a^2 is the larger denominator) and always **a>b.**

$\frac{(x-h)^2}{a^2} + \frac{(y-k)^2}{b^2} = 1$ — Major axis is parallel to x-axis

$\frac{(x-h)^2}{b^2} + \frac{(y-k)^2}{a^2} = 1$ — Major axis is parallel to y-axis

- The center is the point (h,k)
- The distance from the center to each vertex is **a**
- The distance from the center to each focus is **c**
- The distance from the center to co-vertex is **b**
- Length of the major axis is **2a**
- Length of the minor axis is **2b**
- Formula for c: $\boldsymbol{c^2 = a^2 - b^2}$



The Hyperbola: Two squared terms being subtracted! (a<c)

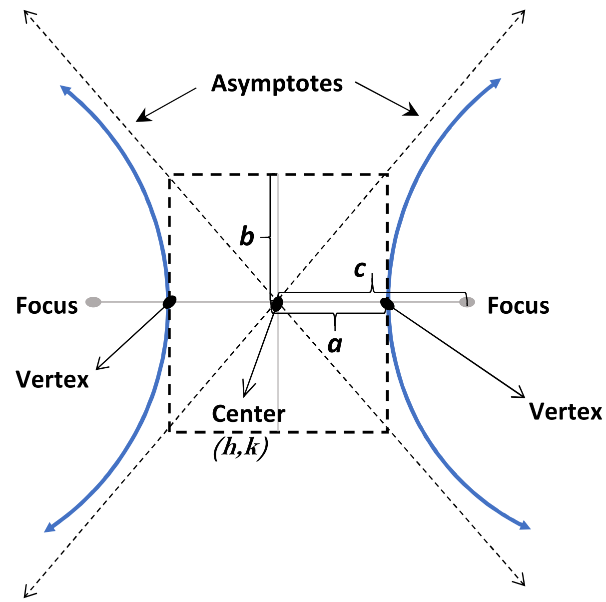
$$\frac{(x-h)^2}{a^2}-\frac{(y-k)^2}{b^2}=1$$

Left/Right with asymptotes at $y-k=\pm\frac{b}{a}(x-h)$

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

Up/Down with asymptotes at $y-k=\pm\frac{a}{b}(x-h)$

- The center is the point (h,k)
- The distance from the center to each vertex is a
- The distance from the center to each focus is c
- The distance from the center to co-vertex is b
- a is not always larger in hyperbola
- a^2 is always with the positive term
- Formula for c: $\boldsymbol{c^2=a^2+b^2}$



The Circle

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

- The center is the point (h,k)
- The distance from the center to any point on the circle (the radius is r)
- The Circumference of a circle is $C=2\pi r$
- The area of a circle is $A=\pi r^2$