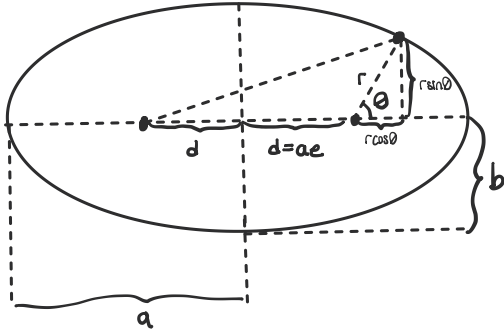


eccentricity: $e = \frac{d}{a} = \frac{\sqrt{a^2 - b^2}}{a}$

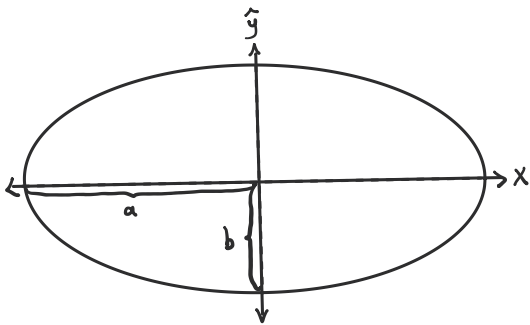
$d = \sqrt{a^2 - b^2}$



$$\left. \begin{aligned} (r \sin \theta)^2 + (2ae + r \cos \theta)^2 &= r^2 + 4ae(ae + r \cos \theta) \\ r + r' &= 2a \end{aligned} \right\}$$

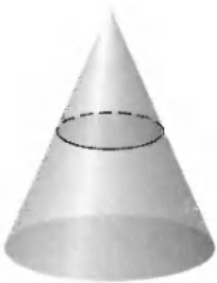
$$r = \frac{a(1 - e^2)}{1 + e \cos \theta}$$

$$\left(r = \frac{a(e^2 - 1)}{1 + e \cos \theta} \text{ if } e > 1 \right)$$



Equation of: $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1 \rightarrow y = \frac{b}{a} \sqrt{a^2 - x^2}$
on Ellipse

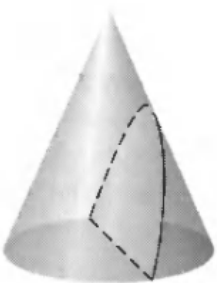
Area: $4 \int_0^a y dx = 4 \int_0^a \frac{b}{a} \sqrt{a^2 - x^2} dx = \pi ab$
for each quadrant



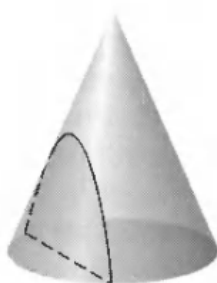
Circle



Ellipse



Parabola



Hyperbola

Parabola
 $e = 1.0$
 $a = 1.0$

Hyperbola
 $e = 1.4$
 $a = 2.5$

Ellipse
 $e = 0.6$
 $a = 2.5$

Circle
 $e = 0.0$
 $a = 1.0$

