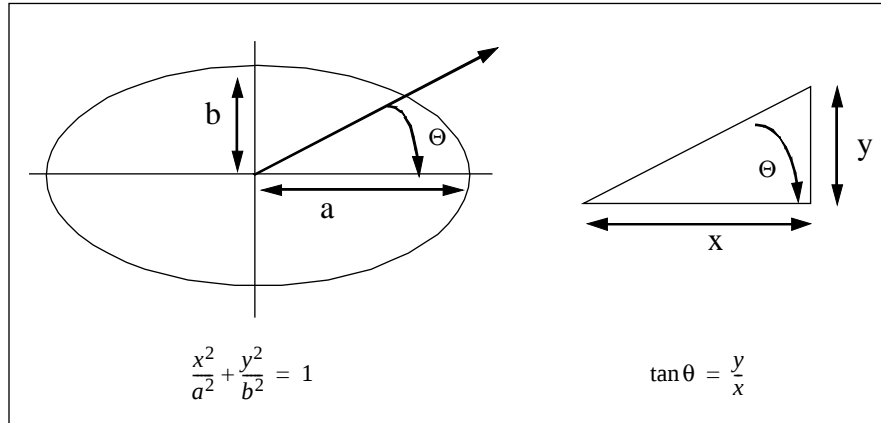


## Ellipse Equations

The x and y position of a point on the locus of an ellipse can be derived given an angle theta



$$\frac{x^2}{a^2} + \frac{x^2 \tan^2 \theta}{b^2} = 1$$

$$\frac{x^2(b^2 + a^2 \tan^2 \theta)}{a^2 b^2} = 1$$

$$x^2 = \frac{a^2 b^2}{b^2 + a^2 \tan^2 \theta}$$

$$x = \frac{ab}{\sqrt{b^2 + a^2 \tan^2 \theta}}$$

$$y = \frac{ab \tan \theta}{\sqrt{b^2 + a^2 \tan^2 \theta}}$$