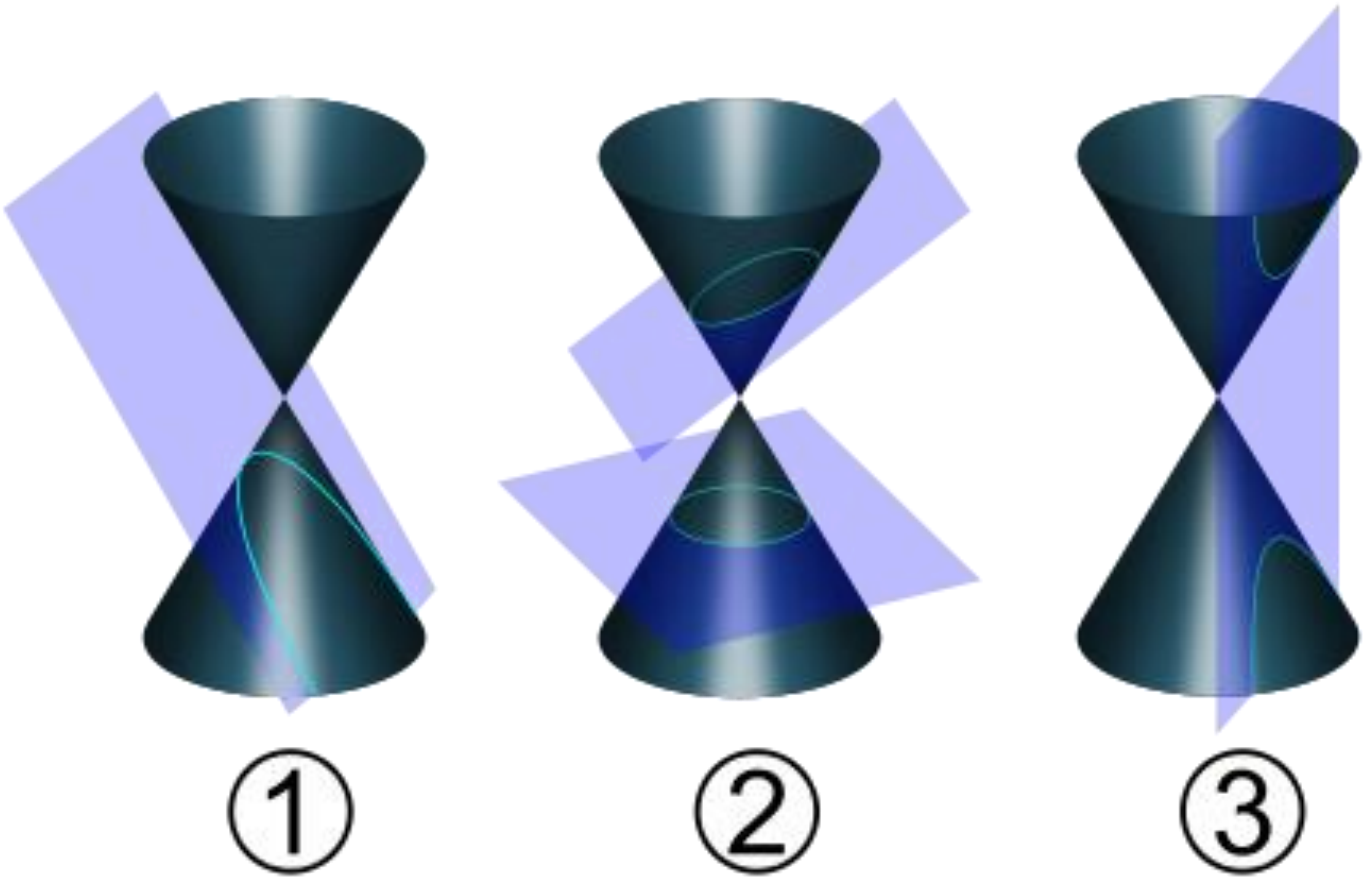
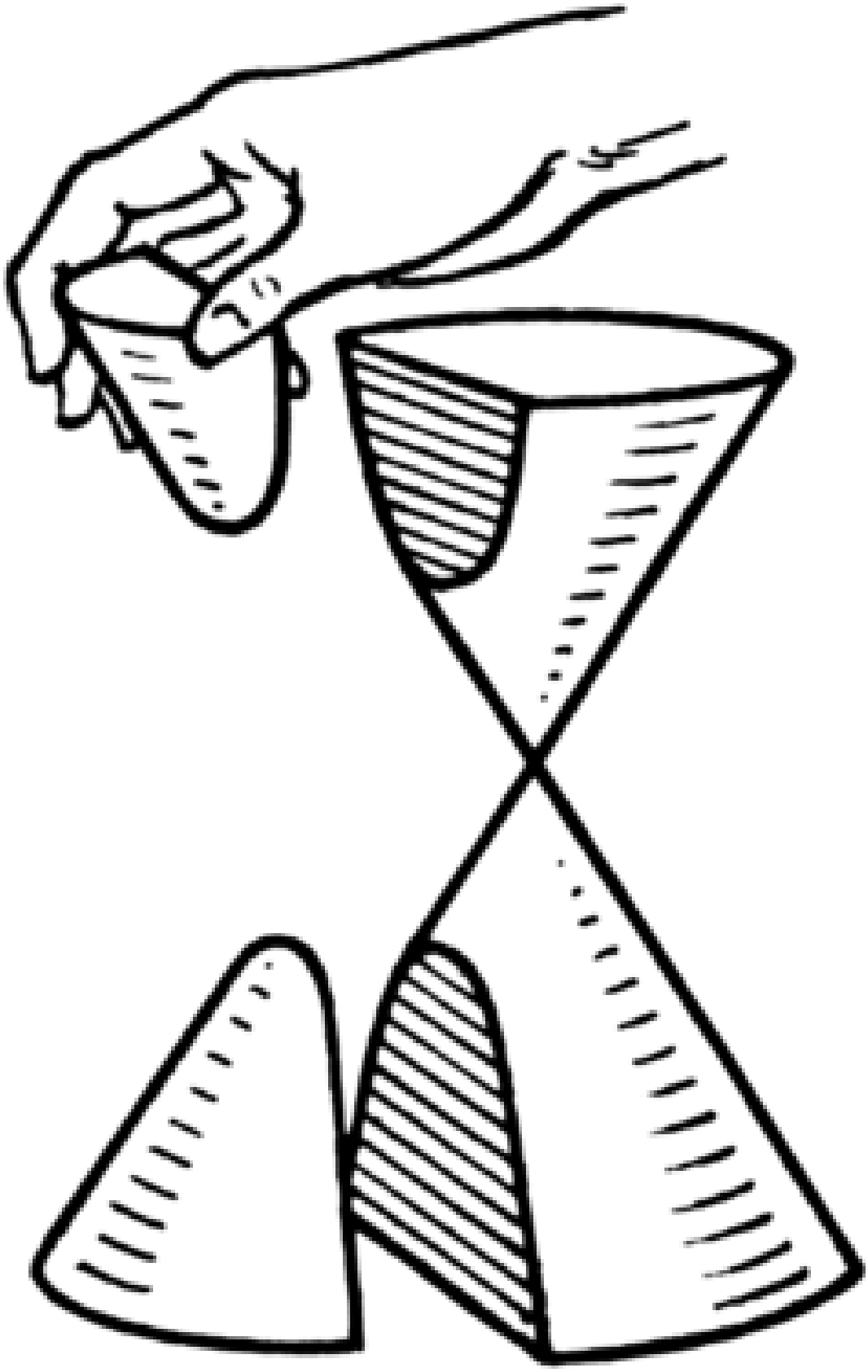
CONIC SECTIONS

If a plane cuts across the cone: $z^2 = x^2 + y^2$,

Then one of the three following scenarios occurs:



1. Parabola: $y = ax^2 + bx + c$
2. Circle/Ellipse: $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$
3. Hyperbola: $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$



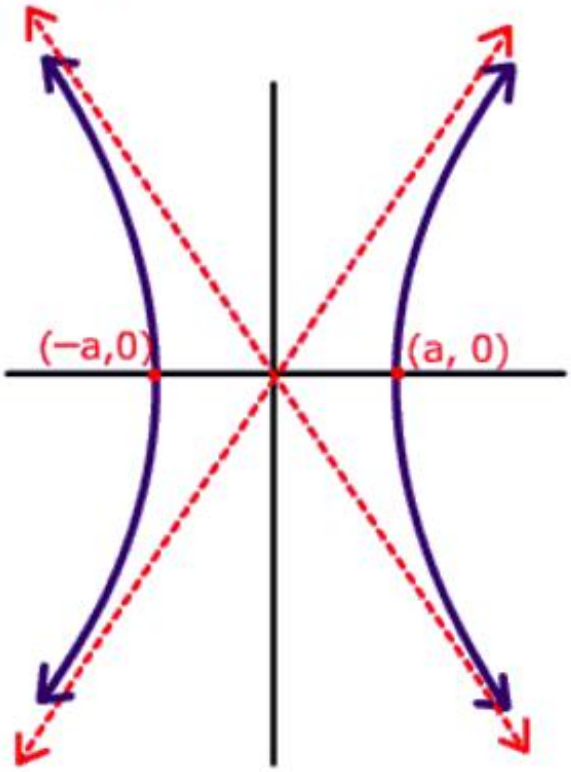
Hyperbola

I assume you are familiar with parabolas and circles/ellipses. However, you may be new to hyperbolas. Below are illustrations of what hyperbolas look like. Note where they cross the axes and note the asymptotes. This should be enough to help you to plot reasonable graphs.

Horizontal Transverse Axis

$$\frac{X^2}{a^2} - \frac{Y^2}{b^2} = 1$$

$y = \frac{-b}{a}x$ $y = \frac{b}{a}x$



Vertical Transverse Axis

$$\frac{Y^2}{a^2} - \frac{X^2}{b^2} = 1$$

$y = \frac{-a}{b}x$ $y = \frac{a}{b}x$