Conics
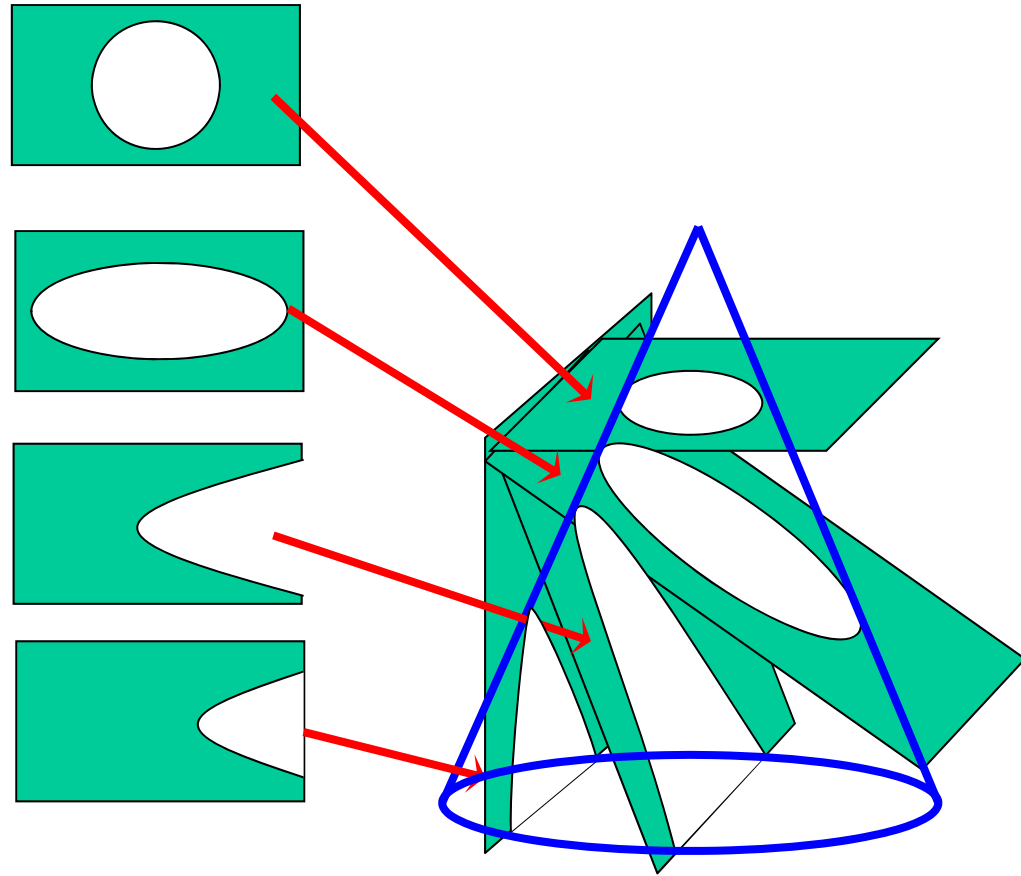
$e = 0$ circle
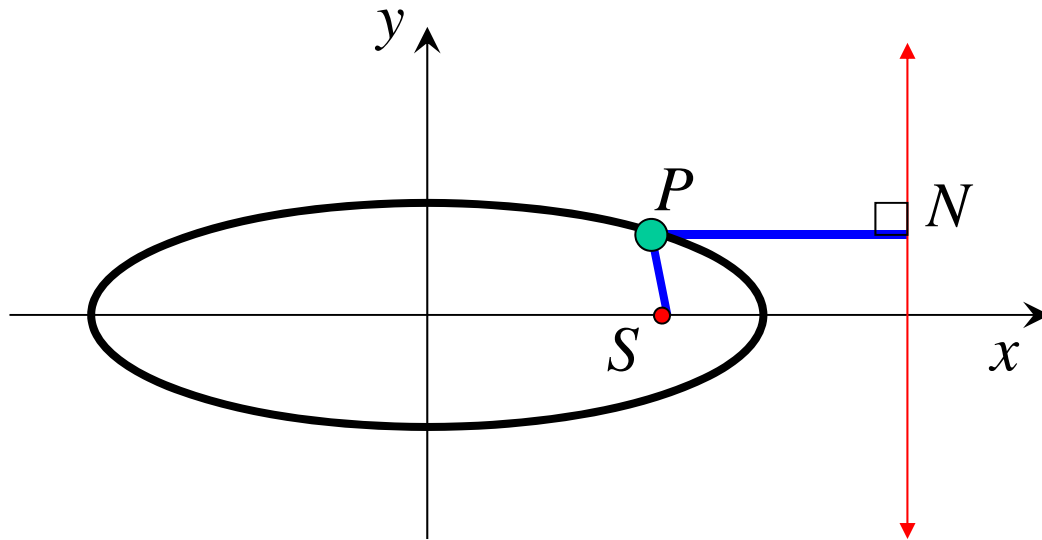
slice horizontal

$0 < e < 1$ ellipse

*slice between horizontal and
parallel to edge*

$e = 1$ parabola
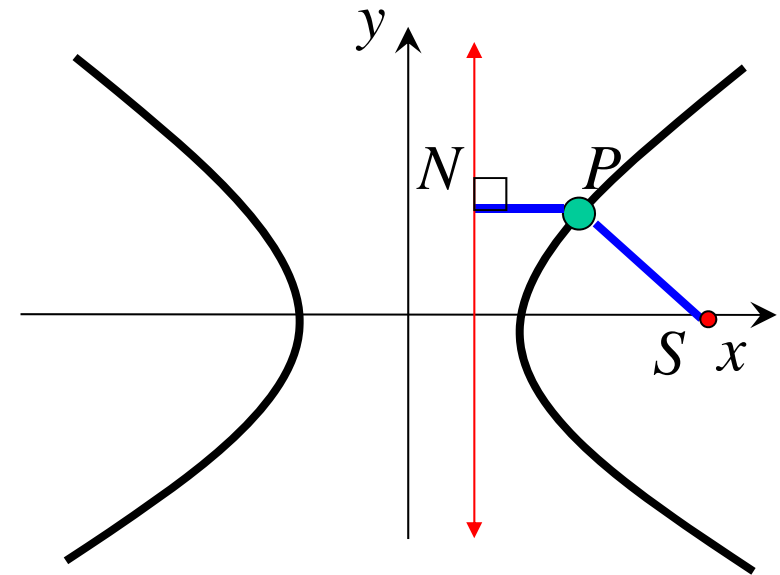
slice parallel to edge

$e > 1$ hyperbola

slice between $\pm$ parallel to edge
vertical slice = rectangular hyperbola

The locus of points whose distance from a fixed point (**focus**) is a multiple, *e*, (**eccentricity**) of its distance from a fixed line (**directrix**)

points on the ellipse are closer to the focus than the directrix

points on the hyperbola are closer to the directrix than the focus

$$PS = ePN$$

$$e = \frac{PS}{PN}$$

Cambridge: **Exercise 3A**