

A *conic*, or *conic section*, is one of the two-dimensional shapes you can get by cutting a slice through a cone: an *ellipse* (including a circle), a *parabola* or a *hyperbola*. These shapes are also the graphs of quadratic equations in two variables.

The general Cartesian equation for these curves is

$$ax^2 + 2hxy + by^2 + 2fx + 2gy + c = 0.$$

The type of curve can be determined by computing $h^2 - ab$:

$h^2 - ab < 0$	ellipse (or circle)
$h^2 - ab = 0$	parabola
$h^2 - ab > 0$	hyperbola

There are also **degenerate** possibilities if the slice passes through the vertex of the cone; in terms of the equation, some choices of the parameters a, b, \dots will give these or equations with no real solutions.