

Ellipse

An *ellipse* is a shape that is made by stretching a circle. It can also be obtained by making a slanting cut through a cone, and is therefore a type of [conic section](#).

Shapes that look like an ellipse are said to be *elliptical*.

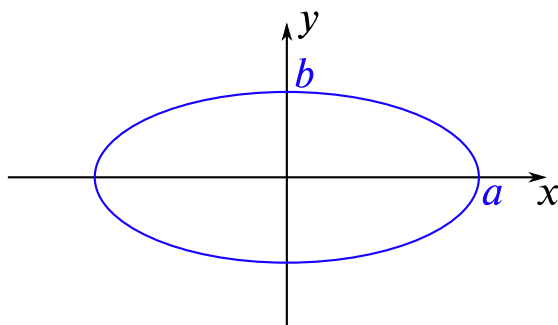
It is also (approximately) the path of an object that orbits the Sun or a planet.

The Cartesian equation of an ellipse centred on the origin with its axes (lines of symmetry) along the coordinate axes is

$$\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1.$$

It can also be described parametrically as

$$\begin{aligned}x(t) &= a \cos t, \\y(t) &= b \sin t.\end{aligned}$$



The longest and shortest lines through the centre of the ellipse are called the *major axis* and *minor axis* of the ellipse; in this case, these lie along the x -axis and y -axis. The lengths a and b are called the [semi-major axis](#) and [semi-minor axis](#) of the ellipse.