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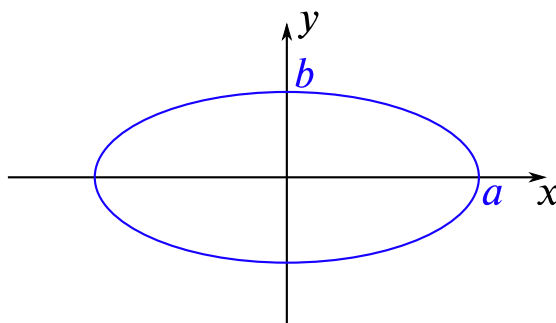
It is also (approximately) the path of an object that orbits the Sun or a planet.

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

$$x(t) = a \cos t,$$
$$y(t) = b \sin t.$$

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.

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