

Conic Sections

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1 Introduction

A conic section, conic or a quadratic curve is a curve obtained from a cone's surface intersecting a plane. The conic sections in the Euclidean plane have various distinguishing properties, many of which can be used as alternative definitions.

2 Types of Conic Section

This section explains two types of conic sections.

- **Ellipse** An ellipse is a plane curve surrounding two focal points, such that

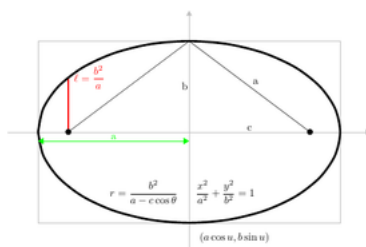


Figure 1: Ellipse

for all points on the curve, the sum of the two distances to the focal points is a constant

- **Parabola** A parabola is a plane curve which is mirror-symmetrical and

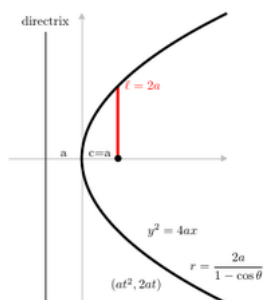


Figure 2: Ellipse

is approximately U-shaped.

3 Properties

This section contains the equations for various conic sections and various parameter values.

3.1 Equations

- **Ellipse** The equation for ellipse in figure 1 is

$$\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1 \quad (1)$$

- **Parabola** The equation for parabola in figure 2 is

$$y^2 = 4ax \quad (2)$$

3.2 Parameters

Conic section type	Eccentricity	Semilatus rectum
Ellipse	$\sqrt{1 - \frac{b^2}{a^2}}$	$\frac{b^2}{a}$
Parabola	1	$2a$