CONIC SECTIONS

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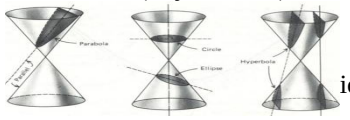
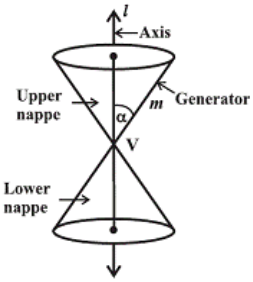
A conic section (or just conic) is a curve obtained by intersecting a cone (more precisely, a right circular con



ical surface) with a plane. A conic may be defined as a plane algebraic curve of degree 2. It can be defined as the locus of points whose distances are in a fixed ratio to some point, called a focus, and some line, called a directrix.

Related Terms



The point V is called the vertex; the line l is the axis of the cone. The rotating line m is called a generator of thecone. The vertex separates the cone into two parts called nappes.

If we take the intersection of a plane with a cone, the section so obtained is called a conic section. Thus, conic sections are the curves obtained by intersecting a right circular cone by a plane.

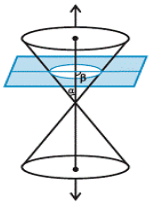
Sections of a cone

We have the following sections of cone:

- Circle
- Ellipse
- Parabola
- Hyperbola

Each of the geometric figures are obtained by intersecting a double-napped right circular cone with a plane. Thus, the figures are called conic sections or conics.

Let’s discuss briefly about each of the above sections of cone:

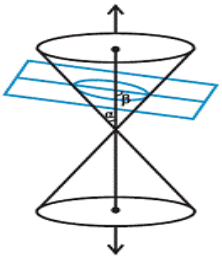


Circle

When ? = 90°, the section is a circle.

If the plane cuts completely across one nappe of the cone and is perpendicular to the axis of the cone, the curve of the section is called a[circle](#).

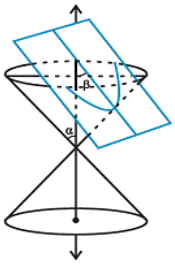
Ellipse



When ? < ? < 90o, the section is an ellipse.

If the plane isn't perpendicular to the axis of the cone, it is called an [ellipse](#).

An ellipse is the set of all points in a plane, the sum of the distances from two fixed points in the plane is constant. Many comets have elliptical orbits.



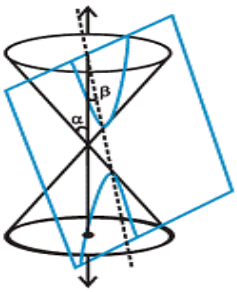
Parabola

When ? = ?; the section is a parabola

If the plane doesn't cut across one entire nappe or intersect both nappes, the curve of the intersection is called a [parabola](#).

A parabola is the set of all points in a plane equidistant from a fixed point and a fixed line in the plane.

Hyperbola



When 0 ? ? < ?; the plane cuts through both the nappes and the curves of intersection is a hyperbola.

If the plane cuts through both nappes of the cone, the curve is called a hyperbola.

The hyperbola is the set of all points in a plane. The difference of whose distance from two fixed points in the plane is the positive constant.

Now try it yourself! Should you still need any help,click here to schedule live online session with e Tutor!

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Reference Links:

- http://en.wikipedia.org/wiki/Cone_(geometry)
- http://en.wikipedia.org/wiki/Focus_(geometry)
- http://en.wikipedia.org/wiki/Directrix#Eccentricity.2C_focus_and_directrix
- http://www.answers.com/topic/conical-surface
- http://en.wikipedia.org/wiki/Circle
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