

Math 1272: Calculus II
10.5 Conic sections

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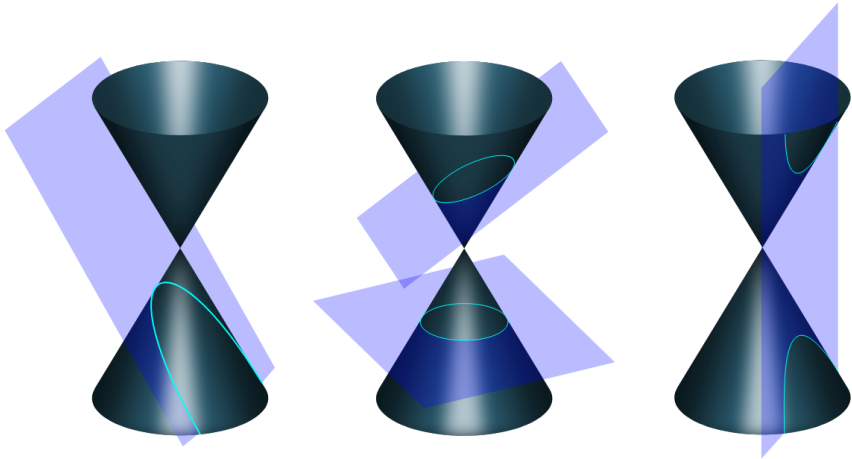
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<http://www-users.math.umn.edu/~jwcalder/1272S19>

Conic sections

<https://commons.wikimedia.org/w/index.php?curid=5919064>



Parabolas

A **Parabola** is the set of points equidistant from a fixed point (the **focus**) and a fixed line (the **directrix**).

Find the focus and directrix of the parabola $y^2 + 10x = 0$ and sketch the graph.

Ellipses

An **Ellipse** is the set of points whose sum of distances to two fixed points F_1, F_2 is constant. F_1 and F_2 are called the **foci** of the ellipse.

Sketch the graph of $9x^2 + 16y^2 = 144$ and locate the foci.

Find an equation of an ellipse with foci $(0, \pm 2)$ and vertices $(0, \pm 3)$.

Hyperbolas

A **hyperbola** is the set of point whose difference of distances to two fixed points F_1, F_2 is constant. F_1 and F_2 are called the **foci** of the hyperbola.

Find the foci and asymptotes of the hyperbola $9x^2 - 16y^2 = 144$.

Find an equation of the ellipse with foci $(2, -2)$, $(4, -2)$, and vertices $(1, -2)$ and $(5, -2)$.

Sketch the conic $9x^2 - 4y^2 - 72x + 8y + 176 = 0$ and find its foci.

