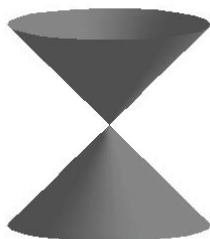


## CHAPTER 7

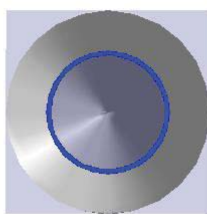
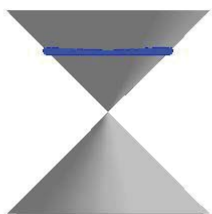
# HOOKED ON CONICS

### 7.1 INTRODUCTION TO CONICS

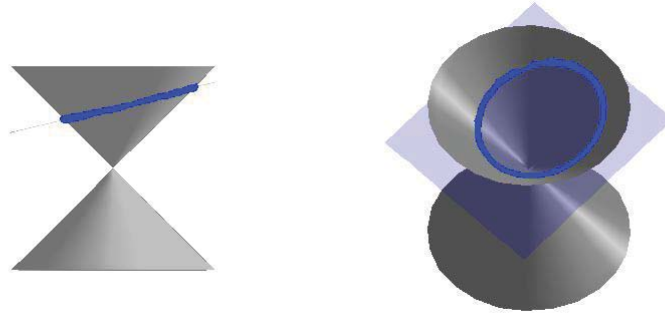
In this chapter, we study the **Conic Sections** - literally ‘sections of a cone’. Imagine a double-napped cone as seen below being ‘sliced’ by a plane.



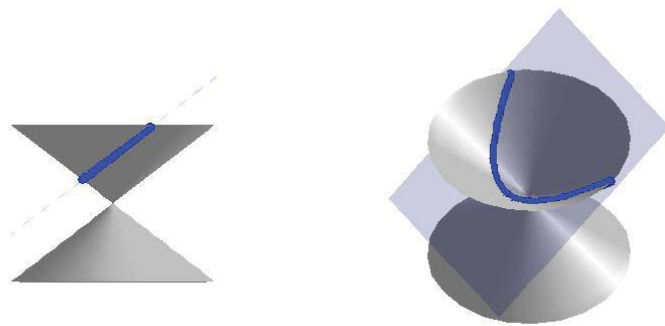
If we slice the cone with a horizontal plane the resulting curve is a **circle**.



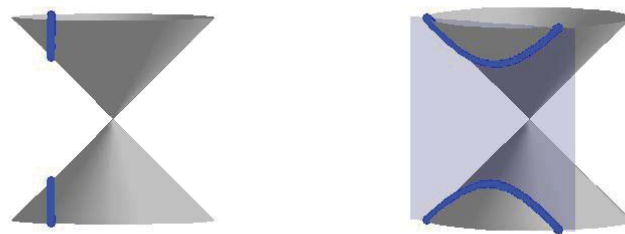
Tilting the plane ever so slightly produces an **ellipse**.



If the plane cuts parallel to the cone, we get a **parabola**.

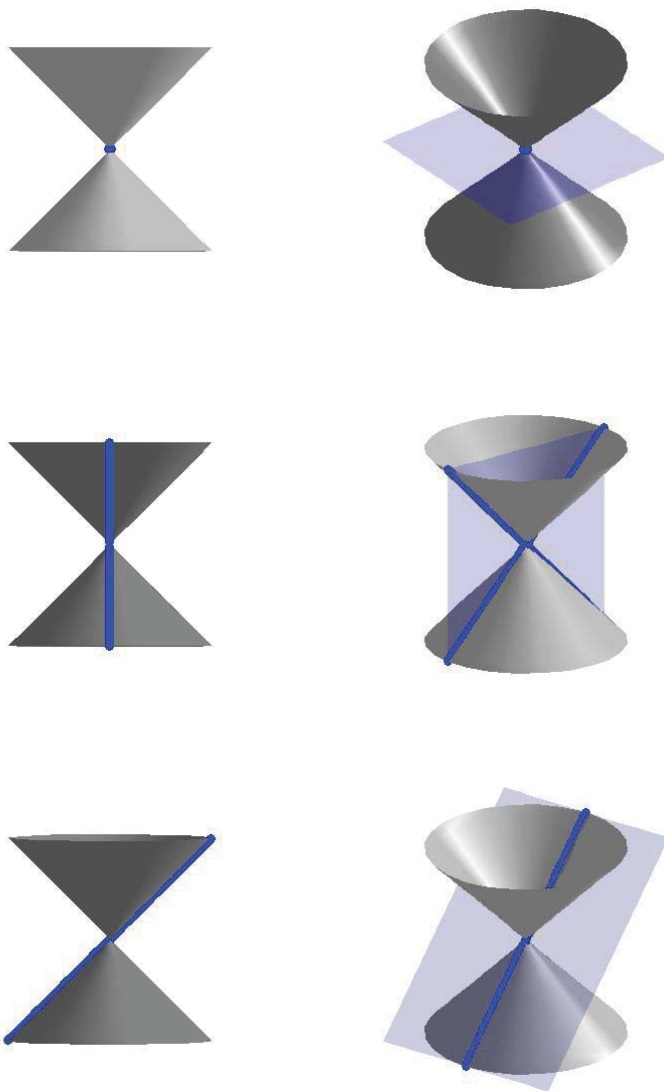


If we slice the cone with a vertical plane, we get a **hyperbola**.



For a wonderful animation describing the conics as intersections of planes and cones, see Dr. Louis Talman's [Mathematics Animated Website](#).

If the slicing plane contains the vertex of the cone, we get the so-called ‘degenerate’ conics: a point, a line, or two intersecting lines.



We will focus the discussion on the non-degenerate cases: circles, parabolas, ellipses, and hyperbolas, in that order. To determine equations which describe these curves, we will make use of their definitions in terms of distances.