Cutting into Conics

Gregory A Nichols

Mathematical Evolutions

Jennifer McCarthy

The University of North Carolina at Charlotte

Abstract

Conics, among the oldest of widely studied mathematical subjects, is defined by the World English Dictionary as "the branch of geometry concerned with the parabola, ellipse, and hyperbola. This widely studied branch of geometry is based around the manipulation of a pair of cones with their vertices stacked upon one another. These two cones can be sliced to make several different formations being, ellipses, parabolas, and hyperbola. My theory was that if there were another two cones added into the formation, perhaps the two additional cones would have some correlation when sliced at the same angle as the original cones. Using only a pencil and a piece of paper I started to lay out the cones in a way that all 4 of the vertices combined into one vertex in the center. I then drew a line through one of the cones making an ellipse however when it came out of the other cone it was parabola. Just with this idea in mind I started to see somewhat of a pattern. The formation I was making in the first cone would affect the shape and possible just the overall formation of my second shape. After playing with that, I moved on to drawing circles and ovals on the inside of the cones.