

VideoText *Interactive*

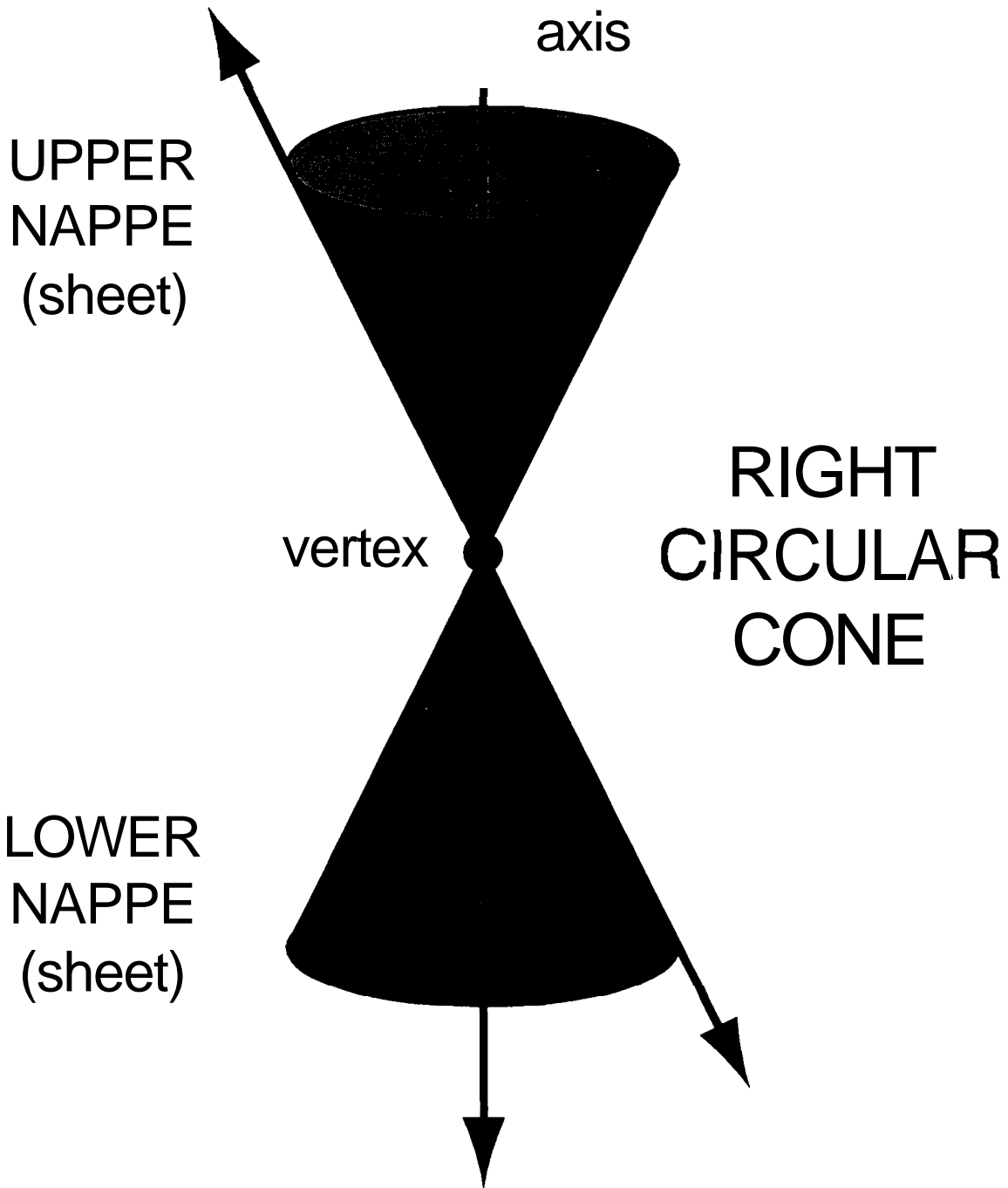
HomeSchool and Independent Study Sampler

Print Materials for “Algebra: A Complete Course”

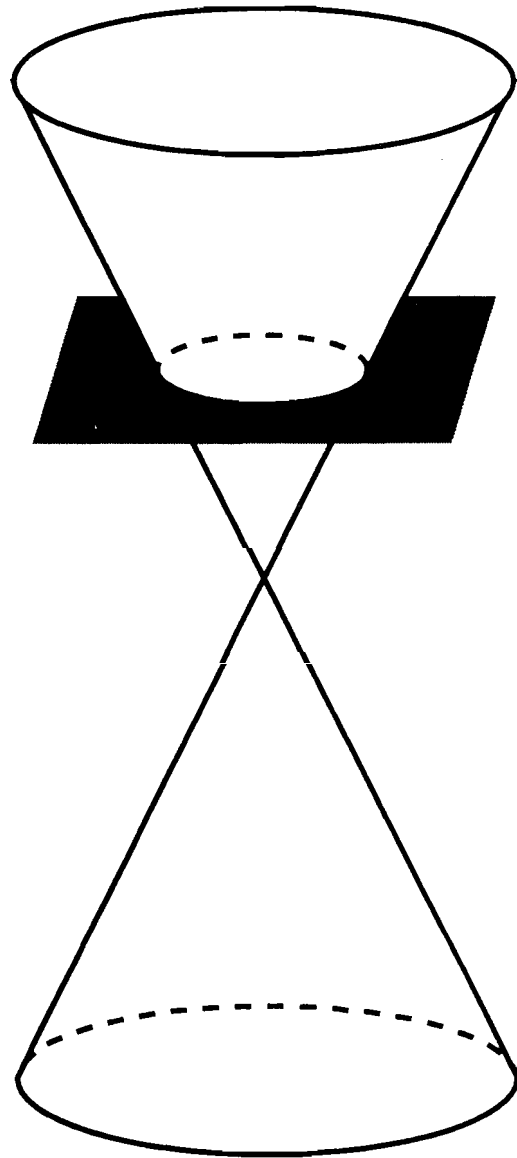
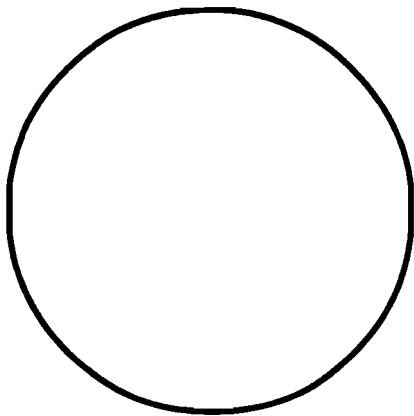
Unit IX, Part A, Lesson 1 – “Origins”

Course Notes (5 page)
Student WorkText (3 pages)

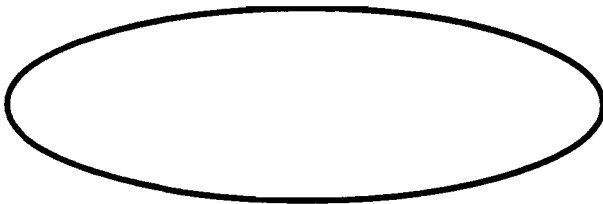
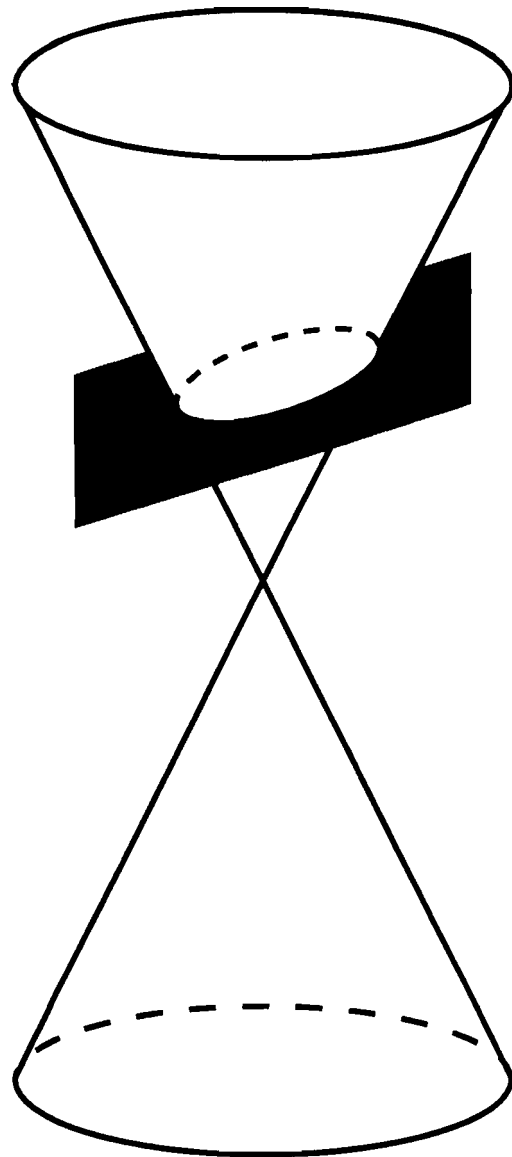
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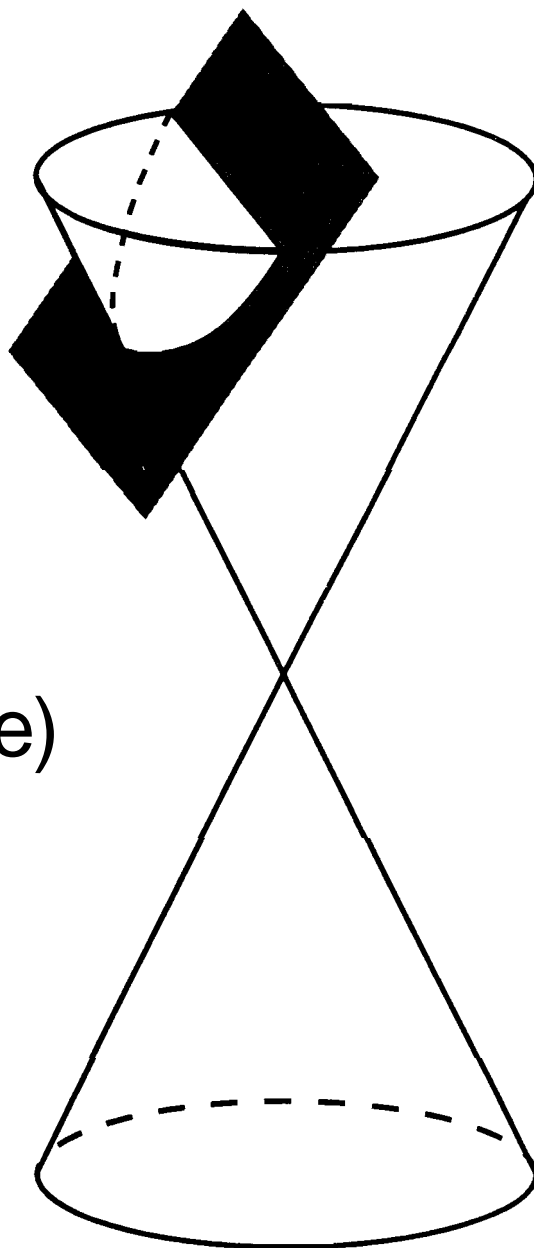
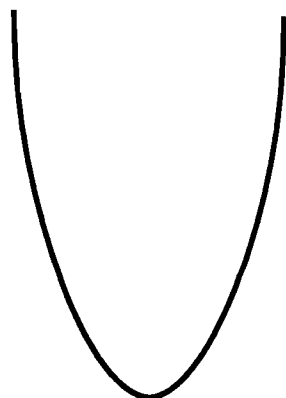
CIRCLE
(ring)



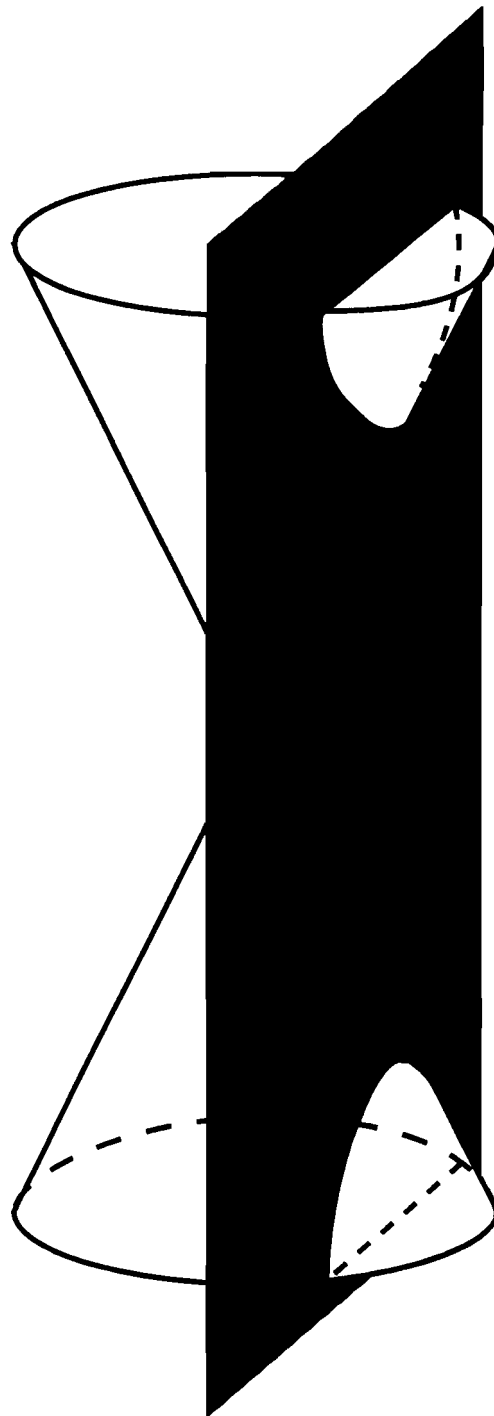
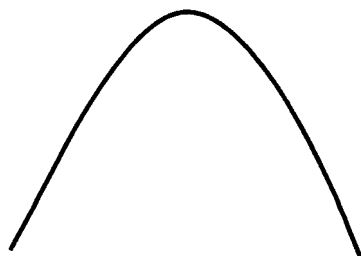
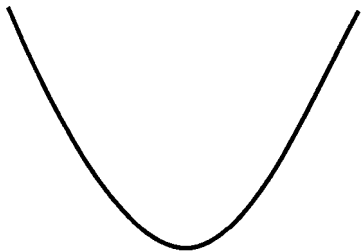
ELLIPSE
(fall short)



PARABOLA (throw alongside)



HYPERBOLA (excess)



Unit IX – The Conic Sections

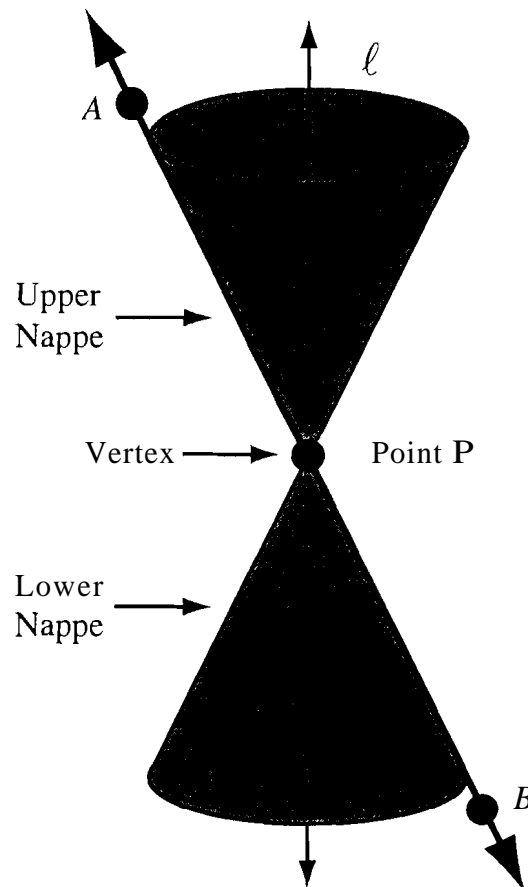
Part A – Parabolas – The Quadratic Function

LESSON 1 *origins*

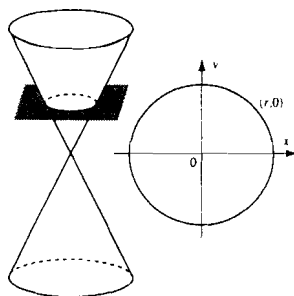
Objective: To understand the origin of and be able to recognize the four conic sections and know the appropriate terms associated with each.

Important Terms:

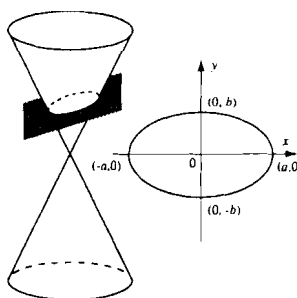
Right Circular Cone – a three dimensional geometric shape, the standard form of which is generated by a line (called the generator) through a point (called the vertex) on another line (called the axis) in such a way that, when the generator is rotated around the axis, it sweeps out a precisely circular path. It consists of 2 circular nappes, one above and one below the vertex. This figure is illustrated, with the appropriate parts labeled, as follows:



Circle – a mathematical curve which can be physically generated by cutting a cone with a plane that is perpendicular to the axis. This curve is illustrated, with the appropriate parts labeled, as follows:

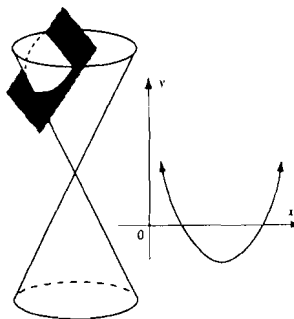


Ellipse – a mathematical curve which can be physically generated by cutting a cone with a plane that is slightly off of perpendicular to the axis. This curve is illustrated, with the appropriate parts labeled, as follows:



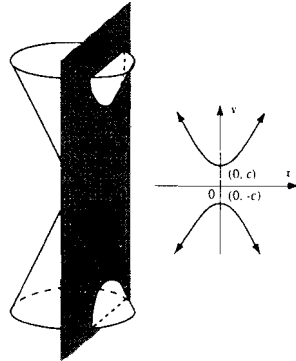
Ellipses are useful in applications such as astronomy, because the planets in our solar system move around the sun in elliptical orbits. Also, telecommunications satellites move in elliptical orbits around the earth.

Parabola – a mathematical curve which can be physically generated by cutting a cone with a plane that is parallel to the generating line. This curve is illustrated, with the appropriate parts labeled, as follows:



Parabolas are useful in applications such as telecommunications, because parabolic reflectors collect television signals from communication satellites. They are also useful in the study of ballistics, because the path of a projectile is parabolic. There are also applications of parabolas in business, chemistry, and electronics, among others.

Hyperbola – a mathematical curve which can be physically generated by cutting a cone with a plane that is parallel to the original axis. This curve is illustrated, with the appropriate parts labeled, as follows.



Hyperbolas are useful in applications such as astronomy, because some comets, unlike Halley's Comet, travel with such speed that they are not captured by the sun's gravitational field. As a result, they enter and leave that field in a hyperbolic path, never to return again.
