Unit 06: Conics

Content Area: **Mathematics**
Course(s): **Generic Course**
Time Period: **Semester 2**
Length: **3 weeks**
Status: **Published**

Standards

MA.K-12.8	Look for and express regularity in repeated reasoning.
MA.G-GPE.A	Translate between the geometric description and the equation for a conic section
MA.G-GPE.A.1	Derive the equation of a circle of given center and radius using the Pythagorean Theorem; complete the square to find the center and radius of a circle given by an equation.
MA.G-GPE.A.2	Derive the equation of a parabola given a focus and directrix.
MA.G-GPE.A.3	Derive the equations of ellipses and hyperbolas given the foci, using the fact that the sum or difference of distances from the foci is constant.

Enduring Understandings

Students will graph all types of conics and partial conics.

Students will recognize a connection between different equations/shapes.

Students will recognize the cause of rotation given an equation.

Essential Questions

Geometrically, what is a conic section?

What is a degenerate conic?

What causes a rotated conic?

How can we determine type of conic given general form?

How can we graph a conic from the standard form equation?

Knowledge and Skills

- Graph a circle
- Write the equation of a circle
- Find the equation of a tangent line to a circle

- Define an ellipse.
- Graph an ellipse
- Write the equation of an ellipse
- Graph hyperbolas
- Write the equation of a hyperbola
- Graph parabolas
- Write the equation of a parabola
- Graph conics with domain restrictions
- Determine if a conic is degenerate or rotated
- Graph rotated conics using a graphing calculator

Transfer Goals

Recognize and solve practical or theoretical problems involving mathematics, including those for which the solution approach is not obvious, by using mathematical reasoning and strategic thinking.

Some problems are better approached from a graphical persepective and others are better approached algebraically.

Resources

Precalculus: Graphical, Numerical, Algebraic 10th Edition

Desmos/Amplify

Deltamath

Problem-Attic

Geogebra