15 Topic: Conic Sections

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

Standards

MA.K-12.2	Reason abstractly and quantitatively.
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

1. Mathematics is a language consisting of symbols and rules.
2. The same mathematical ideas can be represented concretely or symbolically.
3. There can be different strategies to solve a problem, but some are more effective and efficient than others.

Essential Questions

How will the student graph the equation of a circle when its in standard form?
How will the student identify the radius and center of a circle?
How will the student write the equation of a circle in standard form?
How will the student complete the square to convert the equation of a circle in standard form?
How will the student graph the equation of the ellipse when its in standard form?
How will the student identify the center and the horizontal and vertical distances from the center of an ellipse?
How will the student write the equation of an ellipse in standard form?
How will the student complete the square to convert the equation of an ellipse into standard form?
How will the student graph the equation of a hyperbola which is in standard form?
How will the student identify the center and horizontal and vertical distances from the center of the hyperbola?
How will the student find the slopes of the asymptotes of a hyperbola?
How will the student write the equation of a hyperbola in standard form?
How will the student complete the square to convert the equation of a hyperbola into standard form?
How will the student find the domain and range of a conic section figure?
How will the student identify the conic section from the equation?

Knowledge and Skills

Understand Parabolas

Understand Ellipses

Understand Circles

Understand Hyperbolas

Graph the Conics

Find the center of a Conic

Put a Conic into (h,k) form

Find the axis of symmetry

Find the equations of asymptotes

Resources

1. McDougal/Littell - Algebra & Trigonometry Structure & Method Book 2

2. Aufmann/Barker/Lockwood - Intermediate Algebra with Applications Sixth Edition

3. Houghton/Mifflin/Harcourt - On Core Mathematics Algebra 2

4. Holt - Algebra 2 with Trigonometry

5. Larson/Boswell - Big Ideas Math: Algebra 2 Texas Edition

6. Khan Academy

7. PurpleMath

8. KutaSoftware

9. CK-12

10. Quizlet

11. Albert I/O

12. Desmos

13. Problem Attic