

# 15 Topic: Conic Sections

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

## Standards

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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

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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

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- 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**

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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**

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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](#)