High School Algebra Playlist: Deriving the Equations of Ellipses and Hyperbolas

Aligns with CCSS.Math.Content.HSG.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.

Related Standards

- CCSS.Math.Content.HSG.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.

Objectives

In this module, you will learn and practice the following skills:

- derive the equation for an ellipse
- derive the equation for a hyperbola

Let's get started!

Key Terms

- An **ellipse** is the locus of points with a constant sum of distances between two fixed points.
- A **hyperbola** is the locus of points with a constant difference of distances between two fixed points.

Connections

- https://openstaxcollege.org/textbooks/algebra-and-trigonometry; section 12.1, about page 1342
- https://openstaxcollege.org/textbooks/algebra-and-trigonometry; section 12.2, about page 1364