

## Now

In Chapter 9, you will apply the big ideas listed below and reviewed in the Chapter Summary on page 668. You will also use the key vocabulary listed below.

## Big Ideas

- 1 Writing equations of conic sections
- 2 Graphing equations of conic sections
- 3 Solving quadratic systems

### KEY VOCABULARY

- distance formula, p. 614
- focus, foci, pp. 620, 634, 642
- directrix, p. 620
- circle, p. 626
- ellipse, p. 634
- vertices, pp. 634, 642
- major axis, p. 634
- co-vertices, p. 634
- minor axis, p. 634
- hyperbola, p. 642
- transverse axis, p. 642
- conic sections, p. 650
- general second-degree equation, p. 653
- quadratic system, p. 658

## Why?

You can use conic sections to describe the shapes of real-world objects. For example, you can use a parabola to model the cross section of a radio telescope.

### Animated Algebra

The animation illustrated below for Exercise 58 on page 625 helps you answer this question: How do the dimensions of a radio telescope determine the equation that models its cross section?

The screenshot shows an interactive learning interface. On the left, a 3D rendering of several radio telescope dishes is shown. Below it, a text box reads: "Radio telescopes have a parabolic cross section that concentrates radio waves." A "Start" button is visible. On the right, a problem-solving interface is displayed. It contains the following text: "Diameter of dish: 25 meters", "Vertex of the dish: (0, 0)", and "Ratio of the focal length to the diameter: 0.36". Below this, a formula is presented: "Focal length = Diameter of dish × Ratio of focal length to diameter". The "Diameter of dish" is represented by a yellow input box containing the number "25". The "Ratio of focal length to diameter" is represented by a yellow input box containing the number "0.36". Below the formula, a diagram shows a parabolic cross-section of a dish on a coordinate grid. The vertex is at the origin (0,0). The focal length is indicated by a vertical arrow from the vertex to a point on the parabola. The diameter is indicated by a horizontal arrow across the top of the dish. A "Check Answer" button is located at the bottom right of the interface. A small note at the bottom left of the diagram area says "Not drawn to scale".

**Animated Algebra** at [classzone.com](http://classzone.com)

Other animations for Chapter 9: pages 615, 621, 635, 643, 649, and 651