Teacher Supporting Materials for
Lesson 2 Episode 3: Exploring

Episode Description

Keoni and Sasha extend their use of the Pythagorean theorem. They determine the x- value for a point on the parabola that has a y-value of 5.

Students' Conceptual Challenges

Representing an unknown distance on the grid can be challenging. Here the distance from the point on the parabola when y = 5 and the y-axis is unknown [**1:32**].

➡ Sasha and Keoni incorrectly label this distance as b^2 [**1:37**] but correctly treat it as b, which is $\approx$ 4.5 [**2:42**]. This inconsistency is addressed later in Lesson 3, Episode 4.

Focus Questions

For use in a classroom, pause the video and ask these questions:

1. [Pause video at **1:40**]. How does Keoni know that the distance from the point on the parabola to the focus is 6?

2. [Pause video at **2:50**]. Sasha wrote 4.5 above the b^2. What does the 4.5 represent?

Supporting Dialogue

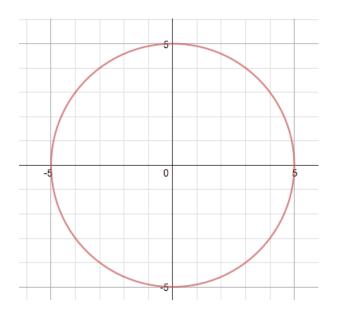Ask your students to reflect on the usefulness of the Pythagorean theorem by asking:

- Why does the Pythagorean theorem work here?

- How do the lengths of the sides of the triangle help you find the coordinates of the point on the parabola?

Math Extensions

1.   A circle is the set of points that are equal distance from a fixed point (called the center). The graph below is of a circle with the center at the origin. Can you find the x-value of a point on the circle below when the y-value is 4? Explain your reasoning.

2.   Find the x-value of a point on the circle shown below when the y-value is 2. Explain your reasoning.