

## Teacher Supporting Materials for Lesson 1 Episode 2: Exploring

### Episode Description

Keoni and Sasha create three different methods for constructing points on the parabola.

### Students' Conceptual Challenges

1. The phrase “set of points” in the definition of a parabola may be misinterpreted as “pair of points.” After finding their first point on the parabola (the point halfway between the focus and directrix), Keoni places a second point close to the first one to form a “pair” [2:11].
  - ➡ Sasha and Keoni test this point using the definition and conclude that it doesn't work.
2. Students may think that a point on the parabola can also be on the directrix [8:24].
  - ➡ Because Keoni is concentrating on points that are 3 inches from the focus, he places a point on the directrix. But he quickly realizes that the point will not satisfy the definition of a parabola because it is not also 3 inches from the directrix.

### Focus Questions

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

1. [Pause Video at 0:48]. Sasha drew a point that she thinks is on the parabola. Keoni suggests that they test her idea. What would be a way to test the point?
2. [Pause the Video at 4:16]. Sasha seems to have a question about the point Keoni proposed. Can you restate her question?

### Supporting Dialogue

When students are working on the tasks in class, you can support dialogue as follows:

- Ask a student to repeat what another student just said, i.e., “Alex, can you share what you heard Lani say?”
- Ask students to relate their actions to the definition, i.e., “Do your points fit the definition of a parabola?”

## Math Extensions

These questions allow students to extend concepts and terminology from the episode:

1. With a pencil and a ruler, draw two parallel lines. What are the points that are the same distance from the two lines that you drew? Explain your solution. How do you know those points you found are the same distance from the two given lines that you drew?
2. Draw three points on a piece of paper. Find the points that are the same distance from each of the three points. Explain your solution. How do you know those points you found are the same distance from the three given points that you drew?