

Teacher Support Material

Lesson 1

Episode 1: Making Sense

Episode Description: Sasha and Keoni make sense of the definition of a parabola.

Students' Conceptual Challenges

1. Keoni thinks the focus should be on the directrix **[2:35]**.
 - ➡ Sasha and Keoni investigate how putting the focus on the directrix leads to the construction of a line rather than a parabola.
2. When Sasha and Keoni try to measure the distance between a point and the directrix, they get different distances depending on what line segment they draw to connect the point and the line **[7:52]**.
 - ➡ They use string to see how the distance along the perpendicular is the shortest distance between a point and a line.

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

1. **[Pause video at 2:01]**. Carefully analyze the definition of a parabola: What parts of the definition did Keoni and Sasha use when they drew these 3 points? What parts are not represented in their diagram?
2. **[Pause video at 8:22]**. What do we mean by the distance between a point and a line? How would you define it? How would you measure it? What do Keoni and Sasha need to understand about the distance between a point and a line?

Supporting Dialogue. When students are working on the task 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 the concepts and terminology from the episode:

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

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