

## Teacher Supporting Materials For Lesson 3 Episode 2: Exploring

### Episode Description

Keoni and Sasha develop an equation that relates the x-value to the y-value for a general point on a particular parabola.

### Students' Conceptual Challenges

Students might wonder how to interpret more than one symbol in a general equation. Students are often asked to isolate a variable on one side of the equals sign with a number on the other side, e.g., they “solve for x” by finding a numerical value for x. Having it make sense that the symbols are representing a general point in the parabola is challenging.

Keoni protests “but there are two variables” when Sasha writes  $(y-1)^2 + b^2 = (y+1)^2$  [1:11-1:34]. By going back to work through a specific example  $6^2 + b^2 = 8^2$ , Sasha and Keoni identify the method to solve for b in the general case [1:47-4:50].

### Focus Questions

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

1. [Pause the video at 1:34]. What problem are Sasha and Keoni trying to solve?
2. [Pause the video at 2:44]. Sasha and Keoni are working to solve for b. Work ahead from here. Then we will compare our work with theirs.

### Supporting Dialogue

Invite students to engage in revoicing. Place a blank student worksheet under a document camera.

1. Can someone come up to the graph to draw and label the right triangle that Sasha and Keoni used in this problem?
2. Ask a student to revoice how a fellow student determined the side lengths.

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## Math Extensions

Use the Pythagorean theorem to represent the lengths of the right triangles described below.

1. A right triangle where one leg is half the length of the other leg.
2. A right triangle where the two legs are the same length.

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