Lesson 4 Teaching Portal Materials

Episode Supports

Episode 6: Exploring

Episode Description

Keoni and Sasha return to the equation y = $\frac{x^2}{4}$ and derive it using the definition of a parabola, the Pythagorean theorem, and their method from Episode 2.

Students' Conceptual Challenges

Sasha and Keoni struggle when the teacher asks them to "mark something that would stand for a *general* point on the parabola" [**2:14**]. Once Sasha marks a point on the parabola, Keoni wants to identify the coordinates of that particular location on the grid, rather than understanding that the point is meant to stand in for all points on the parabola. Sasha is unsure how to represent the point and wants to call is "Point X."

- It helps them to explore the meaning of a particular point (6,9). They use the fact that the 6 is represented on the x-axis and the 9 on the y-axis to similarly label their general point as (x,y). They continue to work with the idea of a general point in future episodes.

Focus Questions

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

1. [Pause the video at **2:35**]. What does it mean to be a general point on the parabola?

2. [Pause the video at **7:06**]. Keoni drew a horizontal line. What property does every point on that line share?

Supporting Dialogue

Ask several students to respond to the question below.

- Keoni and Sasha are often drawing a horizontal or vertical line. How are they using those lines in their problem solving?

Math Extensions

1. Consider the circle below. Can you find an equation of the circle that is solved for y? What about for x?