Lesson 10 Teaching Portal Materials

Episode Supports

Episode 2: Exploring

Episode Description

Sasha and Keoni graph the equation $y = \frac{(x-2.4)^2}{6}$. They determine the coordinates of the focus and the equation of the directrix from the geometric information in the equation.

Students' Conceptual Challenges

The placement of the focus, which is no longer on the y-axis, is challenging for students. Keoni initially misplaces it at (0, 1.5). He apparently considers the value of *p* (which is 1.5) but doesn't move the focus to (2.4, 1.5).

> ➢ When Keoni examines his graph, he notices that the placement of the focus "doesn't look right." He adjusts the placement of the focus.

Focus Questions

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

1. [Pause the video at **0:52**]. The upper left window shows Keoni's work. Where has he placed the focus and directrix? What would justify the placement there?

2. [Pause the video at **3:25**]. Look at the expression that Keoni wrote above the graph, $\frac{(0-2.4)^2}{6}$. What geometric information can he get out of that expression?

Supporting Dialogue

Invite students to generate multiple strategies to find points on the parabola by asking:

- With your partner, reflect on what strategies Sasha and Keoni use to find points on the parabola. What are other strategies that you can use to locate and determine the coordinates of points on a parabola? Prepare to share your strategies with the whole class.

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Learning through dialogue

Math Extensions

Special points are points on the parabola that are horizontally level with the focus. What are the coordinates of the special points of the parabola represented by the equation $y = \frac{(x-2.4)^2}{6}$? Explain how you know.