

Lesson 8 Teaching Portal Materials

Episode Supports

Episode 5: Exploring

Episode Description

Sasha and Keoni now consider how the equation of the parabola will change if the parabola moves up on the coordinate grid. They derive the equation for a parabola with a vertex at $(0, 2)$.

Students' Conceptual Challenges

Sasha seems unsure of the placement of the directrix [2:13-2:28]. This is the first time the directrix and focus have not been equidistant from the origin.

- They resolve the issue by using “special points” and the definition of a parabola.

Focus Questions

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

1. [Pause the video at 0:51]. What is your prediction for an equation of a parabola where the p -value stays at 3, the h -value stays at 0, and the k -value changes to a value such as 2?
2. [Pause the video at 5:57]. What do you notice about the lengths of the right triangle? How are they like the representations of the lengths of the sides of the triangles when you derived the equations of other parabolas? How are they different?

Supporting Dialogue

Invite students to engage in a pair-share activity as they respond to each focus question:

- With your partner, make a prediction for the equation of parabola with a p -value of 3 and a vertex at $(0, 2)$. Prepare your answers to share with the whole class.
- With your partner answer Focus Question 2. Where are the differences and similarities coming from? Prepare to share your answers with the whole class.

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Math Extensions

1. Derive an equation for a parabola with its vertex at $(0, 5)$ and a p -value of 3. What do you notice?

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