

Lesson 7 Teaching Portal Materials

Episode Supports

Episode 5: Making Sense

Episode Description

Sasha and Keoni use “the special points” on the three parabolas to generate another explanation for why increasing the p -value results in the parabola getting wider on the coordinate grid.

Students’ Conceptual Challenges

Sasha notices a feature of the special points: the x -value is double the y -value. When asked to explain why that is true, both Keoni and Sasha pause [1:57].

- ➔ Keoni returns the definition of the parabola to attend to the distances of the special point from the focus and directrix. Both Sasha and Keoni attend to the features of the coordinate grid as well as to how one assigns coordinates to a point on the parabola. They mark up the coordinate grid to show how the x -value is equivalent to twice the y -value [3:14–3:26].

Focus Questions

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

1. [Pause the video at 2:16]. What is the scale of the coordinate grid? How do you know?
2. [Pause the video at 5:59]. What happens to the special point when the x -value doubles from $p = 1$ to $p = 2$?

Supporting Dialogue

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

- With your partner, predict the coordinates for the “special point” of a parabola for different p -values: $p = 2, 4,$ or 5 . How do you know those are the coordinates? Prepare your answers to share with the whole class.

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- With your partner, write down your conjecture of what happens to the width of the parabola on the coordinate grid as the p -value increases. Prepare to share your conjecture with the whole class.

Math Extensions

- Show that the point $(2p, p)$ is on the parabola using both geometric and algebraic reasoning.

