Lesson 7 Teaching Portal Materials

Episode Supports

Episode 4: Repeating Your Reasoning

Episode Description

Sasha and Keoni use points on three parabolas that share a *y*-value to explain why increasing the *p*-value results in the parabola getting wider on the coordinate grid.

Students' Conceptual Challenges

Sasha and Keoni are examining the equation $16 = \frac{x^2}{p}$ when they are asked that happens to *x* when *p* increases. They pause as they search for an explanation **[4:21]**.

- By using algebra to rewrite the equation so that the variables are expressed in a direct relation with each other, $x = 4\sqrt{p}$, Sasha and Keoni find a way to respond to the question. The direct representation supports their reasoning on how a change in the *p*-value impacts the *x*-value.

Focus Questions

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

1. [Pause the video at **1:53**]. Keoni considers a parabola that goes through the origin and contains the point (4.5. 4). Can someone come up here and draw the rest of the parabola and estimate where the focus would be?

2. [Pause the video at **6:44**]. How did Keoni and Sasha get the equation $x = 4\sqrt{p}$?

Supporting Dialogue

Support the opportunity for students to engage in precise language as they articulate mathematical claims:

- As the *x* – value changes, how does the focus change?

- Restate the claim and reasoning Sasha and Keoni use to argue why the parabola gets wider as the *p*-value increases.

Math Extensions

1. Find the coordinates of points on each of the three parabolas when the *y*-value is 1.

2. Considering the ordered pairs that you found, what do you notice about the *x*-values when the *p*-value increases? How does that impact the width of the parabola as the *p*-value changes?