Lesson 6 Teaching Portal Materials

Episode Supports

Episode 3: Reflecting

Episode Description

Keoni and Sasha reflect on the two parabolas that they graphed in Episodes 1 and 2 ($y = x^2$ and $y = \frac{x^2}{2}$). They notice several features of the parabolas that change when the p-value increases from $\frac{1}{4}$ to $\frac{1}{2}$.

Students' Conceptual Challenges

When Keoni and Sasha are asked what things they notice about the two graphs, they hesitate [**0:31-0:43**]. They might be struggling to identify the mathematically significant features on their graphs.

- They begin with more prominent features, like the *p*-value, focus and directrix of each parabola. Then the teacher encourages them to look at a more subtle feature—what Sasha and Keoni call "special points."

Focus Questions

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

1. [Pause the video at **1:22**]. What else do you notice about the two graphs?

2. [Pause the video at **1:30**]. What makes a "special point" special? What do you notice about the two special points that Sasha and Keoni graphed?

Supporting Dialogue

Provide opportunities for productive disagreement by asking:

- Keoni and Sasha have graphed two parabolas (shown in blue and red) on the same coordinate grid. A student, Tessa, looks at the graphs and says, "The blue parabola will never be as high as the red parabola." Do you agree or disagree with Tessa? Why?

Math Extensions

1. Graph the parabolas represented by the equations $y = \frac{x^2}{2}$ and $y = -\frac{x^2}{2}$.

2. Compare the two graphs. What is the same and what is different?

3. What do you notice about the focus and directrix of each graph?