

Lesson 9 Teaching Portal Materials

Episode Supports

Episode 1: Making Sense

Episode Description

Sasha and Keoni examine the different equations they derived for parabolas with a p -value of 3 and a vertex not at the origin. By noticing patterns between the location of the vertex and the equation for the parabola, they make a prediction for the general equation of a parabola with a vertex at (h, k) and an unknown p -value.

Focus Questions

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

1. [Pause the video at [3:43](#)]. What is a general equation of a parabola with a vertex at the origin and a focus placed at a distance of p away from the origin?
2. [Pause the video at [6:55](#)]. What method did Sasha use to locate the focus above the vertex? Why not just count boxes?

Supporting Dialogue

Focus students' attention on precision of language by attending to Sasha's justification:

- Sasha provides some justification for why the location of the focus and directrix of the parabola with a vertex of $(9, 13)$ and a p -value of 5. Can someone revoice her ideas?
- Keoni and Sasha made a conjecture for a general equation of a parabola with a vertex at (h, k) and an unknown p -value? Can someone revoice their conjecture?

Math Extensions

1. What would be the location of the focus and directrix of a parabola with a vertex at $(-3, 5)$ and a p -value of 7? Explain how you know.
2. A parabola has a focus at $(4, 9)$ and a directrix of $y = 5$. What are the coordinates of the vertex of the parabola? How do you know?

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