Lesson 8 Teaching Portal Materials

Episode Supports

Episode 4: Repeating Your Reasoning

Episode Description

Sasha and Keoni extend their work from the last episode to derive the equation of another parabola. This time the vertex of the parabola is at (–3, 0).

Students' Conceptual Challenges

Keoni and Sasha predict two different options for the equation of the parabola with a *p*-value of 3 and a vertex at (–3, 0). The do not know whether the term in the equation will be $x - 3$ or $x + 3$. They are unsure how to distinguish which term is correct.

- Keoni and Sasha begin to apply their method from previous episodes to derive the equation of a parabola. As they draw the right triangle, Sasha notices that the correct term is $x + 3$. Keoni labels the horizontal length of the triangle. He differentiates between the x and the $+3$, and indicates where the $+3$ comes from.

Focus Questions

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

1. [Pause the video at **3:18**]. What has Sasha just noticed?

2. [Pause the video at **4:13**]. What equation could Keoni and Sasha build using the right triangle that they just labeled?

Supporting Dialogue

Support the opportunity for students to engage in productive disagreement:

- Sasha claims that the do not need to do all the math [**4:10-4:13**]. Who agrees? Who disagrees?
- Ask students to defend each position.

Math Extensions

1. Visit the **GeoGebra** applet. Adjust the *h*-value so that the vertex moves to (–8, 0). What are the coordinates of the focus for this new parabola?

   GeoGebra applet URL: https://tube.geogebra.org/material/simple/id/1420529