

Lesson 4 Teaching Portal Materials

Episode Supports

Episode 2: Exploring

Episode Description

Keoni and Sasha use the definition of a parabola and the Pythagorean theorem to solve for the y -value of a point on the parabola when the x -value is 5.

Students' Conceptual Challenges

Sasha and Keoni are unsure how to represent distances involving the unknown value of y [see [0:46 – 1:14](#)].

- ➔ Keoni returns with more confidence to his idea from Episode 1 of representing one of the distances as $y - 1$ [[1:15](#)].

Focus Questions

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

1. [Pause the video at [1:54](#)]. Keoni has written down an equation. Why is that equation true?
2. [Pause the video at [2:28](#)]. Examine the expressions on both sides of the equals sign. How are they the same? How are they different?

Supporting Dialogue

Facilitate the action of providing justification by asking students to:

- Explain why the distance from the point $(5, y)$ to the directrix is $y + 1$. Support your argument by labeling y , 1, and $y + 1$ on the graph.
- Explain why the length of the vertical side of the right triangle is $y - 1$. Support your argument by labeling y , 1, and $y - 1$ on the graph.

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Math Extensions

1. Multiply the binomials and simplify by combining like terms. What pattern do you see emerging?

$$(4 + x)(x + 4)$$

$$(x^2 + x)(x^2 + x)$$

$$(x + y)(x + y)$$

$$(5x - 2y)(5x - 2y)$$

$$(4 - x)(4 - x)$$

2. Justify by showing your work and explaining your reasoning. Are any of the following expressions equivalent to $3xy$?

$$3x3y$$

$$xy + xy + xy$$

$$xy^3$$

$$x + x + x + y + y + y$$

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