Lesson 10 Teaching Portal Materials

Episode Supports

Episode 5: Reflecting

Episode Description

Sasha and Keoni examine yet another equation of a parabola that is not in vertex form, $y = x^2 - 4x + 5$. They start out by seeking a method to re-express the equation in vertex form.

Students' Conceptual Challenges

Re-expressing this equation in vertex form is challenging. Many students have experiences re-expressing quadratic expressions in factored form. Keoni writes $(x - 5)(x + 1)$. While this is true, it does not support their problem solving goal.

➢ After looking for geometric information, Keoni erases his factored representation. Sasha and Keoni keep working to find a way to re-express the equation in vertex form.

Focus Questions

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

1.   [Pause the video at **1:38**]. Why did Keoni erase $(x - 5)(x + 1)$? What's wrong?

2.   [Pause the video at **3:00**] What do think of Sasha's expression $x(x - 4) + 5$? Is it correct? Does it help?

Supporting Dialogue

Invite students to reflect on problem solving as a whole class. Elicit multiple answers from the class:

• At **2:23**, Keoni says "let's not give up." What do you do when you get stuck?

• It seems that Sasha and Keoni make progress when the teacher asks how the equation $y = x^2 - 4x + 5$ is different from $y = x^2 - 4x + 4$. How does that question help them? How can they check that $y = x^2 - 4x + 5$ is the same as $y = (x - 2)^2 + 1$?

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Learning through dialogue

Math Extensions

1. Rewrite the equation $y = x^2 - 4x + 7$ in vertex form. How do you know the two equations are equivalent?

2. Rewrite the equation $y = x^2 - 4x + 3$ in vertex form. How do you know the two equations are equivalent?