Unit 3 Lesson 18: The Quadratic Formula and Complex Solutions

1 Math Talk: Real or Not? (Warm up)

Student Task Statement

Mentally decide whether the solutions to each equation are real numbers or not.

$w^2 = \text{-}367$

$x^2 + 25 = 0$

$(y + 5)^2 = 0$

$(z + 5)^2 = \text{-}367$

2 Be Discriminating

Student Task Statement

Kiran was using the quadratic formula to solve the equation $x^2 - 12x + 41 = 0$. He wrote this:

$$x = \frac{12 \pm \sqrt{144 - 164}}{2}$$

Then he noticed that the number inside the square root is negative and said, "This equation doesn't have any solutions."

1. Do you agree with Kiran? Explain your reasoning.

2. Write $\sqrt{-20}$ as an imaginary number.

3. Solve the equation $3x^2 - 10x + 50 = 0$ and plot the solutions in the complex plane.
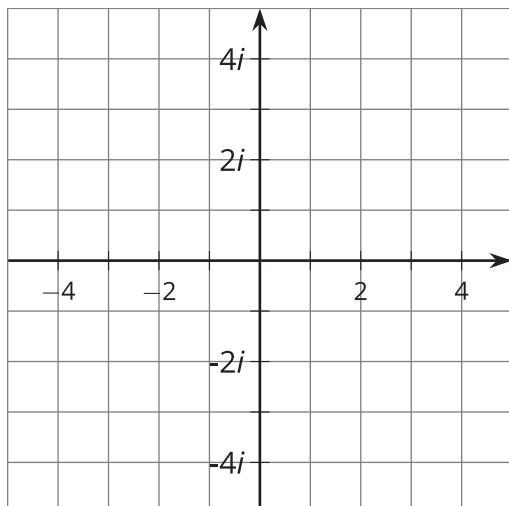
3 Solving All Kinds of Quadratics

Student Task Statement

For each row, you and your partner will each solve a quadratic equation. You should each get the same answer. If you disagree, work to reach agreement.

partner A	partner B
$x^2 - 4x - 4 = 0$	$(x - 2)^2 = 8$
$(y - 2)^2 = $ -8	$y^2 - 4y + 12 = 0$
$(z + \frac{3}{2})^2 = $ -$\frac{29}{4}$	$2z^2 + 6z = $ -19
$w^2 + 3w = 5$	$(w + \frac{3}{2})^2 = \frac{29}{4}$
$4t^2 - 20t + 25 = 0$	$4(t^2 - 5t) = $ -25