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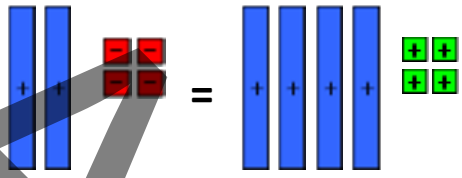
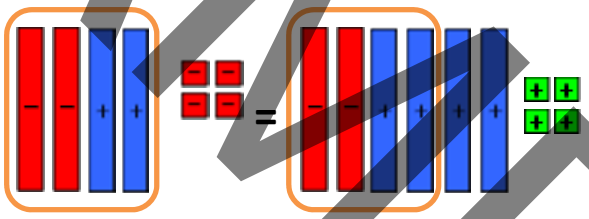
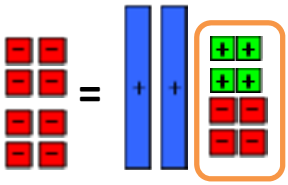
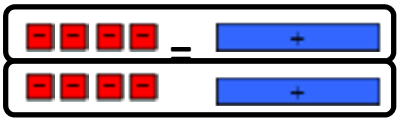
Solving One-Variable Equations and Inequalities

Explore

The equation $2x - 4 = 4x + 4$ is solved using algebra tiles below.

Symbolic	Tiles	Verbal Description	Property of Equality
$2x - 4 = 4x + 4$		Build two x's plus four negative units equal to four x's plus four positive units	N/A
$2x - 4 = 4x + 4$ $-4 = 2x + 4$		Add two negative x's to both sides of the equation and remove zero pairs	Addition Property of Equality
$-4 = 2x + 4$ $-8 = 2x$		Add four negative units to both sides of the equation and remove zero pairs	Addition Property of Equality
$-8 = 2x$ $-4 = x$		Divide the tiles on each side of the equal sign into 2 equal groups.	Division Property of Equality

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Use algebra tiles to solve the following equations. Sketch the tiles at each step, write the verbal description of the actions you made with the tiles, and identify the property of equality that justifies those actions.

Equation 1: $5x - 3 = 2x + 6$			
Symbolic	**Tiles**	**Verbal Description**	**Property of Equality**
$5x - 3 = 2x + 6$			

Equation 2: $2(x - 3) = x + 2$			
Symbolic	**Tiles**	**Verbal Description**	**Property of Equality**
$2(x - 3) = x + 2$			

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Equation 3: $-3(2x - 5) = -3$			
Symbolic	**Tiles**	**Verbal Description**	**Property of Equality**
$-3(2x - 5) = -3$			

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Use what you learned about solving equations with integer coefficients and variables on both sides of the equal sign to solve the following equations.

1. $0.2x - 4 = 0.4x + 4$

2. $0.25x = 0.2x - 25$

3. $\frac{3}{4}x = x + 5$

4. $\frac{3}{4}x - 2 = \frac{2}{5}x + 5$

Debriefing Questions

1. How did the actions you took with the tiles compare to the symbolic representations?

2. How does solving equations with integer coefficients compare to solving equations with decimal coefficients?

3. How does solving equations with integer coefficients compare to solving equations with fractions as coefficients?