Algebra 1: Unit 2: Lesson 7
Explaining Steps for Rewriting Equations

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Learning Goal:

- Explain (orally and in writing) why performing certain operations on an equation may create equivalent equations but performing other operations may not.
- Understand that dividing by a variable is not used in solving equations because it can lead to equations that have fewer solutions than the original equation.
- Understand that equations that are not true for any value of the variable(s) do not have solutions.

Activity Purpose

- Encounter an example where the given equation has no solutions and performing the familiar moves leads to an untrue statement.
- Come across an equation that is divided by a variable expression and make sense of why it leads to a false statement.

Approaches to Monitor

- Plug in a possible solution to test for correctness.
- Solve the equation and compare steps and rationale.

Discuss your observations with your group and be prepared to share your conclusions. If you get stuck, consider solving each equation.

1.

$x + 6 = 4x + 1 - 3x$	original equation
$x + 6 = 4x - 3x + 1$	✓ apply the commutative property
$x + 6 = x + 1$	✓ combine like terms
$6 = 1$	subtract x from each side

Plug in 1.
$1 + 6 = 4(1) + 1 - 3(1)$
$7 = 4 + 1 - 3$
$\times$ $7 = 2$ $\times$

His moves are correct, so there aren't any correct values for x.

2.

$2(5 + x) - 1 = 3x + 9$	original equation
$10 + 2x - 1 = 3x + 9$	✓ apply the distributive property
$2x - 1 = 3x - 1$	✓ subtract 10 from each side
$2x = 3x$	✓ add 1 to each side
$2 = 3$	divide each side by x ?

$2(0) = 3(0)$ ✓

This isn't true but I think x could be 0.

Geometry: Unit 6: Lesson 5
Squares and Circles

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Learning Goal:

- Calculate and interpret trinomials in expanded and factored form in equations for circles.

Activity Purpose

- Students practice squaring binomials to help them learn to rewrite perfect square trinomials.

Approaches to Monitor

- Using patterns from their distributive property work, recognize that if the constant term is the square of half the coefficient of x, then the expression is a perfect square trinomial.

3. Which of these expressions are perfect square trinomials? If you get stuck, look for patterns in your earlier work.

a. $x^2 - 6x + 9$ half of -6 is -3 $-3^2 = 9$

b. $x^2 + 10x + 20$ X no. 10 is haf of 20.

c. $x^2 + 18x + 81$ half of 18 is 9 $9^2 = 81$

d. $x^2 - 2x + 1$ X 1 is smaller than 2 so it can't be

e. $x^2 + 4x + 16$ X no. 4^2 is 16 so no.

Algebra 2: Unit 2: Lesson 11
Finding Intersections

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Learning Goal:

- Calculate the solution to a system of polynomial equations.

Activity Purpose

- Solve systems of equations involving quadratics.

Approaches to Monitor

- Solving without dividing by terms with an x in them, or using factoring to avoid missing potential solutions.

For each pair of polynomials given, find all points of intersection of their graphs.

3. $m(x) = (x + 7)(x - 4)$ and $n(x) = (2x + 5)(x - 4)$

$\frac{(x+7)(x-4)}{(x-4)} = \frac{(2x+5)(x-4)}{(x-4)}$

$x + 7 = 2x + 5$

$2 = x$

4. $p(x) = (x + 1)(x - 8)$ and $q(x) = (x + 2)(x - 4)$

$(0+1)(0-8) \neq (0+2)(0-4)$

$-8 = -8$ ✓

$x = 0$