

Algebra 1: Unit 2: Lesson 7

Explaining Steps for Rewriting Equations



Learning Goal:

- Let's think about why some steps for rewriting equations are valid but other steps are not.

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

His moves are correct, aren't they?

Plug in 1.

$$1 + 6 = 4(1) + 1 - 3(1)$$

$$7 = 4 + 1 - 3$$

$$\times 7 = 2 \times$$

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

$$2(0) = 3(0) \quad 2x = 3x$$

✓ add 1 to each side

$$2 = 3$$

divide each side by x ?

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

Geometry: Unit 6: Lesson 5

Squares and Circles



Learning Goal:

- Let's see how the distributive property can relate to equations of 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. $x^2 - 6x + 9$ *haf of -6 is -3 $-3^2 = 9$*
- b. $x^2 + 10x + 20$ *X no. 10 is haf of 20.*
- c. $x^2 + 18x + 81$ *haf 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



Learning Goal:

- Let's think about two polynomials at once.

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 $n(x) = (2x + 5)(x - 4)$

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

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

$$(0+1)(0-8) \neq (0+2)(0-4)$$
$$-8 \neq -8 \checkmark$$
$$\boxed{x=0}$$