Name:	Math 7.2, Period
Mr. Rogove	Date:

**LEARNING OBJECTIVE:** We will identify the steps used in solving equations and understand a few steps we CANNOT take when solving equations. (Alg1M1L6)

## **ACTIVATING PRIOR KNOWLEDGE:**

We understand different properties used in math.

Why do the equations $(x -$	1)(x + 3) = 17 + x and $(x + 3)(x - 1) = 17 + x$ have
the same solution set?	COMMUTATIVE PRIPERTY.

Why do the equations (x - 1)(x + 3) = 17 + x and  $x^2 + 2x - 3 = 17 + x$  have the same solution set?

Why do equations (x-1)(x+3) = 17 + x and (x-1)(x+3) + 500 = 517 + x have the same solution set?

have the same solution set?  $\overline{PROP}$ . OF EQUALTY FOR A DITTON Why do the equations (x-1)(x+3) = 17 + x and 3(x-1)(x+3) = 51 + 3x have the same solution set?  $\overline{PROP}$ . OF EQUALTY FOR MULTIPLICATION

## **CONCEPT DEVELOPMENT:**

Solving Equations Requires us to make use of the <u>Commutative</u>, Associative and <u>Distributive</u> Properties AS WELL AS use properties of equality to find a solution for a variable.

Example:  $x(1-x) + 2x - 4 = 8x - 24 - x^2$ 

_			_
1	$x - x^2 + 2x - 4 = 8x - 24 - x^2$	Distributive property	
2	x + 2x - 4 = 8x - 24	Added $x^2$ to both sides of the equation $\mathbb{R}^2$	op. of 29
3	3x - 4 = 8x - 24	Collected like terms	+ (
y	3x + 20 = 8x	Added 24 to both sides of the equation	
ᆫ	20 = 5x	Subtracted $3x$ from both sides of the	
5		equation	
	x = 4	Divided both sides of the equation by 5	

What is the common solution to all 6 equations listed above? How do we know?

x will always = 4. In each step, WE MAINTAINED equality.
We manipulated expressions

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What are some things we need to look out for when applying the rules of equality and rules of arithmetic?

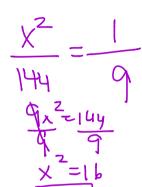
$$\frac{x}{12} = \frac{1}{3}$$

1. If we do something the left side of the equation, we have to do the same thing to the right side, correct?? What about eliminating both denominators and just saying that x = 1. Why doesn't that work?

12+3

2. What about squaring both sides of the equation so that

Does this change the solution to the equation? \square



# **GUIDED PRACTICE:**

Steps for Solving Equations AND Identifying the Steps Taken

- 1. Simplify your equation step by step using properties of equality and properties of arithmetic.
- 2. Identify each step along the way.
- 3. Check your solution by substituting your simplified answer into your original equation.

Solve for *x* and describe the operation used in each step along the way.

$$7x - [4x - 3(x - 1)] = x + 12$$

$$7x - (4x - 3x + 3) = x + 12$$

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$$7x - (5x - 3x$$

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Solve for *x* and describe the operation used in each step along the way.

$$2[2(3-5x)+4] = 5[2(3-3x)+2]$$

$$2(6-10x+4)=5(6-6x+2)$$
 Dstrib. Prop. 12-20x+8=30-30x+10 Distrib. Prop.

-20x+20 = -30x+40 -20x+20 = -30x+40 -30x + 30x 10x+20 = 40 -20x+20 = 40

Solve for x and describe the operation used in each step along the way.

$$\frac{1}{2}(18 - 5x) = \frac{1}{3}(6 - 4x)$$

# **INDEPENDENT PRACTICE:**

- 1. Consider the equations x + 1 = 4 and  $(x + 1)^2 = 16$ .
- a. Verify that x = 3 is a solution for both equations.
- b. Find a second solution for the second equation.
- c. What effect does squaring both sides of an equation seem to have on the solution set?
- 2. Consider the equation x 3 = 5.
- a. Multiply both sides of the equation by a constant, and show that the solution set did not change.
- b. Now multiply both sides by x. x(x-3) = 5x

Show that x = 8 is still a solution to the equation.

- c. Show that x = 0 is also a solution to the new equation.
- d. Now multiply both sides by the factor (x-1). (x-1)x(x-3) = 5x(x-1)

Show that 8 is still a solution to the new equation.

e. Show that x = 1 is also a solution.

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<b>CLOSURE:</b> Closure is exit ticket to be collecte	dhomework if necessary?
Notes:	

#### NOTES:

This lesson maps to Lesson 12 and 13 in Algebra 1, Mod 1 of ENY. Homework (inclass??) should be exit ticket for exit 13