

NAME: _____

Math _____, Period _____

Mr. Rogove

Date: _____

LEARNING OBJECTIVE: We will solve equations involving the distributive property. (G8M4L5)

CONCEPT DEVELOPMENT:

The Distributive Property is used to expand expressions.

Example: $2(3x - 10)$ is rewritten as $6x - 20$.

$$(2 \cdot 3x) - (2 \cdot 10)$$
$$6x - 20$$

$$-4(11x + 3)$$
$$(-4 \cdot 11x) + (-4 \cdot 3)$$
$$\boxed{-44x - 12}$$

$$\cancel{-4(11x + 3)}$$
$$\cancel{-44x - 12}$$

The Distributive Property applies only to terms within a group (inside parentheses).

Example: $4(3x - 5) + 12 = 12x - 20 + 12$

$$= 12x - 8$$

CLEAR THE PARENTHESES
expand the expression

$$10(3 + x) - x$$
$$(10 \cdot 3) + (10 \cdot x) - x$$
$$30 + 9x$$
$$\boxed{9x + 30}$$

If there is a subtraction sign before the parentheses, we need to take the opposite of each of the terms within the group.

Example: $33 - (12x - 54) + 3x = \underline{33} - \underline{12x} + \underline{54} + \underline{3x}$

$$-9x + 87$$

$$-1(-12x + 3)$$
$$\boxed{12x - 3}$$

GUIDED PRACTICE:

Steps for Solving Equations Involving the Distributive Property

1. Use the distributive property to expand the expression within the grouping symbol.
2. Use the properties of equality to get all of your variable terms on one side of the equation, and your constant terms on the other side.
3. Combine like terms.
4. Use the properties of equality to isolate your variable.
5. Check your solution.

1a. Circle your fractions!

$3 \left[-(x-7) + \frac{5}{3} \right] = 2(x+9) - 3$ $3(-x+7+\frac{5}{3}) = 2(x+9) - 3$ $-3x+21+5 = 2x+18-3$ $-3x+26 = 2x+15$ $+3x \quad +3x$ $26 = 5x+15$ $\frac{-15}{-15} = \frac{5x}{-15} + \frac{15}{-15}$ $\frac{11}{-15} = \frac{5x}{-15}$ $x = \frac{11}{5}$ <div style="border: 1px solid black; padding: 5px; display: inline-block; margin-top: 10px;"> <p>CHECK</p> $-\left(\frac{28}{9}-7\right) + \frac{5}{3} = 2\left(\frac{28}{9}+9\right) - 3$ $-\left(\frac{28}{9}-\frac{63}{9}\right) + \frac{15}{9} = 2\left(\frac{28}{9} + \frac{81}{9}\right) - 3$ $\frac{91}{9} + \frac{15}{9} = 2\left(\frac{109}{9}\right) - 3$ $\frac{106}{9} = \frac{218}{9} - 3$ $\frac{106}{9} = \frac{106}{9}$ </div>	$4x + 3(4x + 7) = 4(7x + 3) - 3$ $4x + 12x + 21 = 28x + 12 - 3$ $16x + 21 = 28x + 9$ $-9 \quad -9$ $16x + 12 = 28x$ $-16x \quad -16x$ $12 = 12x$ $\frac{12}{12} = \frac{12x}{12}$ $x = 1$ <p style="text-align: right; margin-top: 20px;">ANSWER $x = 1$ <u>CHECK:</u></p>
$20 - (3x - 9) - 2 = -(-11x + 1)$ $20 - 3x + 9 + 2 = 11x - 1$ $-3x + 27 = 11x - 1$ $+3x \quad +3x$ $27 = 14x - 1$ $+1 \quad +1$ $28 = 14x$ $\frac{28}{14} = \frac{14x}{14}$ $x = 2$ <p style="margin-top: 20px;">21 = 21 ✓</p>	$17 - 5(2x - 9) = -(-6x + 10) + 4$ $17 - 10x + 45 = 6x - 10 + 4$ $62 - 10x = 6x - 6$ $+10x \quad +10x$ $62 = 16x - 6$ $+6 \quad +6$ $68 = 16x$ $\frac{68}{16} = \frac{16x}{16}$ $x = \frac{68}{16} = \frac{17}{4}$

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$$7x - (3x + 5) - 8 = \frac{1}{2}(8x + 20) - 7x + 5$$

$$\frac{1}{2}(4x + 6) - 2 = -(5x + 9)$$

$$2(x + 1) = 2x - 3$$

$$\begin{array}{r} 2x + 2 = 2x - 3 \\ -2x \quad -2x \end{array}$$

$$2 = -3$$

There is no value for x
that would make the equation
true

NO SOLUTION

$$* 9(4 - 2x) - 3 = 4 - 6(3x - 5)$$

$$-18x + 33 = -18x + 34$$

NO SOLUTION

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INDEPENDENT PRACTICE:

$$\frac{4}{9} + 4(x - 1) = \frac{28}{9} - (x - 7x) + 1$$

$$5(3x + 4) - 2x = 7x - 3(-2x + 11)$$

$$8 - \frac{35a}{3} = -\frac{7a}{3} - 4\left(\frac{4a}{3} - \frac{1}{4}\right)$$

Write 2 different equations that will have no solution. Explain how you know.

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ACTIVATING PRIOR KNOWLEDGE:

We can simplify expressions that use the distributive property

$\begin{aligned} &\rightarrow 6x - 3(4x - 2) + 15 \\ &6x + (-3)(4x + (-2)) + 15 \\ &\underline{6x} + \underline{(-12x)} + \underline{6} + \underline{15} \\ &\boxed{-6x + 21} \end{aligned}$	$\begin{aligned} &14 - (3x - 39) - 3x \\ &\underline{14} + \underline{(-3x)} + \underline{39} + \underline{(-3x)} \\ &\boxed{-6x + 53} \\ &53 + (-6x) \end{aligned}$
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CLOSURE:

Solve for x:

$$5(3x + 9) - 2x = 15x - 2(x - 5)$$

TEACHER NOTES:

ENY Lesson 6

HW: Either Understanding the Process for Solving Linear Equations or Multistep Equations with Distribution.