

# Lesson 3.1 Solving Linear Equations with one Variable (Day 5)

## Math Warm Up

Write the problem AND answers in the table below.

	My Thinking	Correct/Compare
<b>Add three to any number then divide by two</b>		
<b>Divide any number by two then add three</b>		

# Lesson 3.1 Solving Linear Equations with one Variable (Day 5)

## Math Warm Up

Write the problem AND answers in the table below.

**Add three to any number then divide by two**

My Thinking

Correct/Compare

$$\frac{x + 3}{2}$$

**Divide any number by two then add three**

$$\frac{x}{2} + 3$$

# Lesson 3.1 Solving Linear Equations with one Variable (Day 5)

## Objective

TSW solve linear equations with one variable by simplifying expressions using distributive property AND

laws of equality

(adding, subtracting, multiplying and dividing on both sides of the equal sign)

- **Common Core State Standards** *8.EE.7 Solve linear equations with one variable*

8EE 7 Solve linear equations in one variable.

8EE 7a Give examples of linear equations in one variable with one solution, infinity many solutions, or no solutions

8EE 7b Solve linear equations with rational number coefficients

- **Mathematical Practices** *1 Solve problems/persevere 2 Reason 4 Model Mathematics 7 Look for and use structure*



▶ Linear equations can be used to solve mathematical and real-world problems. A linear equation with one variable can have one solution, no solution, or infinitely many solutions.

# Lesson 3.1 Solving Linear Equations with one Variable (Day 5)

Use the distributive property to simplify

The **Distributive Property** is an algebra property which is used to multiply a single term and two or more terms inside a set of parentheses. Take a look at the problem below.

$$2(4 + 3)$$

# Lesson 3.1 Solving Linear Equations with one Variable (Day 5)

Use the distributive property to simplify

The **Distributive Property** is an algebra property which is used to multiply a single term and two or more terms inside a set of parentheses. Take a look at the problem below.

$$2(4 + 3)$$


$$2(4 + 3)$$

$$2 \times 4 + 2 \times 3$$

$$14$$


# Lesson 3.1 Solving Linear Equations with one Variable (Day 5)

Use the distributive property to simplify

$$4(v + 3)$$

# Lesson 3.1 Solving Linear Equations with one Variable (Day 5)

$$4(y + 3)$$


$$4(y + 3)$$

# Lesson 3.1 Solving Linear Equations with one Variable (Day 5)

Use the distribute property to simplify

$$n(n - 9)$$



# Lesson 3.1 Solving Linear Equations with one Variable (Day 5)

$$n(n-9)$$


$$n(n-9)$$

# Lesson 3.1 Solving Linear Equations with one Variable (Day 5)

Use distribute property to simplify

$$(2 - n)8$$

# Lesson 3.1 Solving Linear Equations with one Variable (Day 5)

$$(2 - n)8$$


$$(2 - n)8$$

# Lesson 3.1 Solving Linear Equations with one Variable (Day 5)

<http://www.showme.com/sh/?h=ud1msAC>

$$7 - (6x - 9)$$
$$-6x + 9$$

# Lesson 3.1 Solving Linear Equations with one Variable (Day 5)

## Example 1

Solve linear equations involving the distributive property.

$$\frac{3x}{4} - \frac{2x + 1}{4} = -1.5$$

Rewrite the left side as a single fraction.

Use the distributive property.

Simplify the numerator.



The first three steps involve simplifying the expression on the left side of the equation.

# Lesson 3.1 Solving Linear Equations with one Variable (Day 5)

## Example 1

Solve linear equations involving the distributive property.

$$\frac{3x}{4} - \frac{2x + 1}{4} = -1.5.$$

### Solution

$$\frac{3x}{4} - \frac{2x + 1}{4} = -1.5$$

$$\frac{3x - (2x + 1)}{4} = -1.5$$

$$\frac{3x - 2x - 1}{4} = -1.5$$

$$\frac{x - 1}{4} = -1.5$$

$$\frac{x - 1}{4} \cdot 4 = -1.5 \cdot 4$$

$$x - 1 = -6$$

$$x - 1 + 1 = -6 + 1$$

$$x = -5$$

Rewrite the left side as a single fraction. Use the distributive property.

Simplify the numerator.

Multiply both sides by 4.

Simplify.

Add 1 to both sides.

Simplify.

# Lesson 3.1 Solving Linear Equations with one Variable (Day 5)

## Guided Practice

Solve each linear equation.

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

Rewrite the left side as a single fraction.

Use the distributive property.

Simplify the numerator.

# Lesson 3.1 Solving Linear Equations with one Variable (Day 5)

## Guided Practice

Solve each linear equation.

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

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

$$\frac{?}{3} = -4$$

Rewrite the left side as a single fraction.  $2x - (2 + x)$

$$\frac{?}{3} = -4$$

Use the distributive property.  $2x - 2 - x$

$$\frac{?}{3} = -4$$

Simplify the numerator.  $x - 2$

$$\frac{?}{3} \cdot \frac{?}{?} = -4 \cdot \frac{?}{?}$$

Multiply both sides by  $\frac{?}{?}$ .  $x - 2; 3; 3; 3$

$$\frac{?}{?} = \frac{?}{?}$$

Simplify.  $x - 2; -12$

$$\frac{?}{?} + \frac{?}{?} = \frac{?}{?} + \frac{?}{?}$$

Add  $\frac{?}{?}$  to both sides.  $x - 2; 2; -12; 2; 2$

$$x = \frac{?}{?}$$

Simplify.  $-10$



# Lesson 3.1 Solving Linear Equations with one Variable (Day 5)

## Guided Practice

**2**  $0.6(1 - x) + 0.2(x - 5) = 10$

# Lesson 3.1 Solving Linear Equations with one Variable (Day 5)

## Guided Practice

2  $0.6(1 - x) + 0.2(x - 5) = 10$   $x = -26$

# Lesson 3.1 Solving Linear Equations with one Variable (Day 5)

## Guided Practice

3  $\frac{3x}{5} + \frac{x - 1}{3} = \frac{2}{15}$

# Lesson 3.1 Solving Linear Equations with one Variable (Day 5)

## Guided Practice

$$3 \quad \frac{3x}{5} + \frac{x-1}{3} = \frac{2}{15} \quad x = \frac{1}{2}$$

# Lesson 3.1 Solving Linear Equations with one Variable (Day 5)

## Independent Practice #1-3

## Challenge- Solve created equation

Name: \_\_\_\_\_

Independent Practice #1-3

### Practice 3.1

1  $4x - (10 - x) = \frac{15}{2}$

2  $0.5(x + 1) - 1 = 0.2$

## Homework

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Wednesday Homework: Evaluating Expressions

#1-12

When finding the value of an expression with more than one operation, perform the operations in the order specified by the order of operations.

#### Order of Operations

1. Perform all operations within grouping symbols first; start with the innermost grouping symbols.
2. Evaluate all powers before other operations.
3. Multiply and divide in order from left to right.
4. Add and subtract in order from left to right.

#### Evaluate each expression.

1.  $4 \times 5 + 8$

2.  $16 - 12 \div 4$

3.  $14 \div 2 + 3(5)$

4.  $5 - 6 \times 2 \div 3$

5.  $2 \cdot 3^2 + 10 - 14$

6.  $2^2 + 32 \div 8 - 5$

7.  $(10 + 5) \div 3$

8.  $5^3 \cdot (8 - 6)$

9.  $(17 - 5)(6 + 5)$

10.  $3 + 7(14 - 8 \div 2)$

11.  $5[24 - (6 + 8)]$

12.  $\frac{14}{3^2 - 2}$

#### Challenge

Evaluate each expression if  $a = 3$ ,  $b = 5$ , and  $c = 6$ .

13.  $a + 3b$

14.  $4b - 3c$

15.  $2a - b + 5c$

16.  $(ab)^2$

17.  $a(b + c)$

18.  $3(bc - 8) \div a$

Course 3

Course 3

Lesson Check —#1 Solve linear equation with one variable

