Edgenuity

Warm-Up | Combining Like Terms to Solve Equations

Lesson Question

Lesson Goals

Identify like terms.

Combine _____ terms.

Use the properties of _____ to solve linear equations.

Words to Know

Fill in this table as you work through the lesson. You may also use the glossary to help you.

addition property of equality	the property stating that adding the _____ quantity to both sides of an equation does not change the solution set
division property of equality	the property stating that dividing both sides of an equation by the same _____ number does not change the equation
inverse operations	operations that "_____" each other, such as addition and subtraction or multiplication and division
multiplication property of equality	the property stating that multiplying _____ sides of an equation by the same value does not change the equation
subtraction property of equality	the property stating that subtracting the same quantity from both sides of an equation does _____ change the equation

© Edgenuity, Inc.

Instruction | Combining Like Terms to Solve Equations

Slide 2

Inverse Operations and Properties of Equality

Inverse operations are operations that "undo" each other: addition and subtraction, multiplication and division.

- **Addition Property of Equality**

$$a + \square = b + c$$

- Solve: $x - 4.3 = 0.55$

$+4.3 \quad +4.3$

$x = \square$

- **Subtraction Property of Equality**

$$a - c = b - \square$$

- Solve: $x + \frac{2}{5} = 8$

$-\frac{2}{5} \quad -\frac{2}{5}$

$x = \square$

More Properties of Equality

Inverse operations are operations that "undo" each other: addition and subtraction, multiplication and division.

- **Multiplication Property of Equality**

$$a \times c = b \times \square$$

Solve: $x \div 3 = 6$ or $\frac{x}{3} = 6$

$3(x \div 3) = 3(6)$

$x = \square$

- **Division Property of Equality**

$$a \div c = b \div c \text{ for } c \neq \square$$

Solve: $5.5x = 33$

$\frac{5.5x}{5.5} = \frac{33}{5.5}$

$x = \square$

© Edgenuity, Inc.

Instruction | Combining Like Terms to Solve Equations

Slide 5

Combine Like Terms to Solve an Equation

PROCEDURE

1. Identify and [ ] like terms.

$$5x + 6x = 66$$

2. Use the properties of [ ] and inverse operations to solve the equation.

$$\frac{\square}{11} = \frac{66}{\square}$$

$$x = 6$$

3. Check your answer.

Check: $5(\square) + 6(6) = 66$

$$30 + \square = 66$$

$$66 = 66 \checkmark$$

© Edgenuity, Inc.

Instruction | Combining Like Terms to Solve Equations

Slide 5

Writing and Solving an Equation

REAL-WORLD CONNECTION

Mrs. Garner needs to arrange 28 desks into rows on each side of her classroom with an aisle in the middle. There is room for 4 rows on the left side, but only 3 rows on the right side. How many desks should be in each row on the right?

1. Write an equation.

$x =$ number of desks in each row

$\square + 3x = \square$

2. Identify and combine like terms.

$\square = 28$

3. Use the properties of equality and $\square$ operations to solve the equation.

$\frac{7x}{\square} = \frac{28}{7}$

$x = 4$

4. Check your answer.

$4(4) + 3(4) = 28$

$\square + 12 = 28$

$28 = 28$ ✓

There should be 4 desks in each row on the right.

© Edgenuity, Inc.

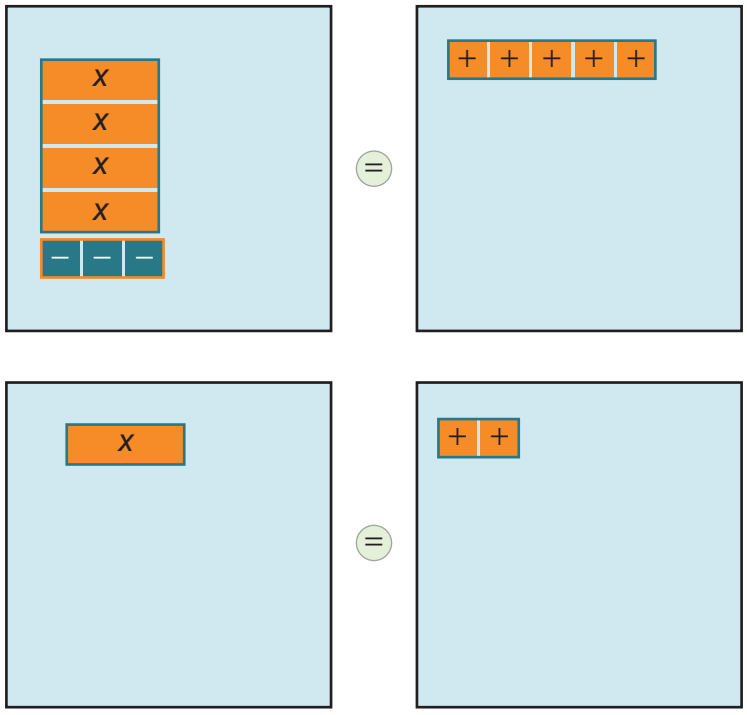
Instruction | Combining Like Terms to Solve Equations

Slide 8

Equations Algebra Tiles Interactive

Solve using Algebra tiles:

$$4x - 3 = 5$$



1. Model the equation using algebra tiles.
2. Use the addition property of equality. Drag 3 orange square tiles to each side to add 3 to both sides of the equation.

$$\begin{array}{r} 4x - 3 = 5 \\ +3 \quad +3 \\ \hline 4x = \square \end{array}$$

3. Click the button to divide both groups by 4.

$$\frac{4x}{4} = \frac{8}{\square}$$

$$x = \square$$

© Edgenuity, Inc.

Instruction | Combining Like Terms to Solve Equations

Slide 10

How to Solve Two-Step Equations

PROCEDURE

1. Undo [ ] or subtraction to isolate the variable term.

Solve $3.25x - 4 = 15.5$ for x.

$$3.25x - 4 = 15.5$$

$$\underline{+4 \quad +4}$$

$$3.52x = \boxed{}$$

2. Undo multiplication or [ ] to isolate the variable.

$$\frac{3.25x}{3.25} = \frac{19.5}{\boxed{}}$$

$$x = \boxed{}$$

3. Check your answer.

Check: $3.25(6) - 4 = 15.5$

$$19.5 - 4 = 15.5$$

$$\boxed{} = 15.5 \checkmark$$

So $x = 6$ is the correct answer.

© Edgenuity, Inc.

Instruction | Combining Like Terms to Solve Equations

Slide 10

Using an Equation to Solve a Word Problem

Morgan wants to buy a new smartphone that costs $172. She has already saved $70. She makes $8.50 per hour babysitting. How many hours will Morgan have to babysit to earn the rest of the money?

1. Write an equation.

h = number of $\square$

$\square + 70 = \square$

2. Undo addition or subtraction.

$-70 \quad -70$

$8.50h = 102$

3. Undo multiplication or division.

$\frac{8.50h}{\square} = \frac{102}{8.50}$

$h = \square$

4. Check your answer.

$8.50(12) + 70 = \square$

$\square + 70 = 172$

$172 = 172$ ✓

Morgan will have to work 12 hours to save up for her new smartphone.

© Edgenuity, Inc.

Instruction | Combining Like Terms to Solve Equations

Slide 12

How to Solve Multi-Step Equations

PROCEDURE

Solve the equation for x.

$$-3x + 6x + 4 = 13$$

1. Identify and combine like terms.

$$\square + 4 = 13$$

$$-4 \quad -4$$

2. Undo addition or subtraction to isolate the variable term.

$$3x = \square$$

$$\frac{3x}{3} = \frac{9}{3}$$

3. Undo multiplication or division to isolate the variable.

$$x = \square$$

4. Check your answer.

$$-3(3) + 6(3) + 4 = 13$$

$$\square + 18 + 4 = 13$$

$$9 + 4 = 13$$

$$\square = 13 \checkmark$$

© Edgenuity, Inc.

Summary

Combining Like Terms to Solve Equations

Lesson Question	How can you solve linear equations by combining like terms?

Answer

Use this space to write any questions or thoughts about this lesson.

© Edgenuity, Inc.