

Math 7 - Unit 2b

Day 9 - Solving Multi-Step Equations by Combining Like Terms

Lesson Objectives:

- I can solve multi-step by combining like terms.
- I know how to show work when solving equations.

Steps for Solving Equations

Step #0 Simplify each side of the equation

- 0a Combine like terms
- 0b *Coming Soon*
- 0c *Coming Next Year*

Step #1 Get rid of the constant

Step #2 Get rid of the coefficient

The substitution property of equality says, if $a = b$, then b may be substituted for a in any expression containing a .

Model each equation on your algebra mat. Then sketch a picture in your notes.

Algebra mat legend: 1 (yellow square), x (green rectangle), -x (red rectangle)

Equation: $9 = 8 + 2x + 7$

Modeling: Left mat has 9 yellow squares. Right mat has 8 yellow squares, 2 green rectangles, and 7 yellow squares.

Handwritten work:

$$9 = 8 + 2x + 7$$

$$9 = 2x + 15$$

$$9 - 15 = 2x + 15 - 15$$

$$-6 = 2x$$

$$\frac{-6}{2} = \frac{2x}{2}$$

$$-3 = x$$

Properties used: Substitution Prop. (=), Subtraction Prop. (-), Division Prop. (=)

Don't forget to check your work!

Model each equation on your algebra mat. Then sketch a picture in your notes.

Algebra mat legend: 1 (yellow square), x (green rectangle), -x (red rectangle)

Equation: $8x - 11 - 7x = -5$

Modeling: Left mat has 8 green rectangles, 11 red squares, and 7 green rectangles. Right mat has 1 green rectangle and 5 red squares.

Handwritten work:

$$8x - 11 - 7x = -5$$

$$x - 11 = -5$$

$$x - 11 + 11 = -5 + 11$$

$$x = 6$$

Properties used: Substitution Prop. (=), Subtraction Prop. (-), Addition

Don't forget to check your work!

$$2w - 4w = -10$$

$$\frac{-2w}{-2} = \frac{-10}{-2}$$

Substitution prop (=)
Division prop (=)

$$w = 5$$

$$x + 3 + 4x + 5 = 15 + 16$$

$$5x + 8 = 31$$

$$5x + 8 - 8 = 31 - 8$$

$$5x = 23$$

$$\frac{5x}{5} = \frac{23}{5}$$

Substitution prop (=)
Subtraction prop (=)
Division prop (=)

$$x = \frac{23}{5}$$

$$16 = w - 2w + 9$$

$$16 = -w + 9$$

$$16 - 9 = -w + 9 - 9$$

$$7 = -w$$

$$\frac{7}{-1} = \frac{-w}{-1}$$

$$-7 = w$$

Substitution prop (=)
Subtraction prop (=)
Division prop (=)

$$18x + 51 - 47x = 225$$

$$-29x + 51 = 225$$

$$-29x + 51 - 51 = 225 - 51$$

$$-29x = 174$$

$$\frac{-29x}{-29} = \frac{174}{-29}$$

$$x = -6$$

Substitution prop (=)
Subtraction prop (=)
Division prop (=)

$$17x - 19 - 8x = 53$$

$$9x - 19 = 53 \quad \text{Substitution Prop (=)}$$

$$\quad \quad \quad +19 \quad +19 \quad \text{Addition Prop (=)}$$

$$\frac{9x}{9} = \frac{72}{9} \quad \text{Division Prop (=)}$$

$$x = 8$$

$$53x - 18 + 7x = 162$$

$$60x - 18 = 162 \quad \text{Substitution Prop (=)}$$

$$\quad \quad \quad +18 \quad +18 \quad \text{Addition Prop (=)}$$

$$\frac{60x}{60} = \frac{180}{60} \quad \text{Division Prop (=)}$$

$$x = 3$$

Homework

Solving Multi-Step Equations by Combining Like Terms WKS

* Individual Think Time *



What to do if you get stuck...

1. Reread the problem. Did you write it down correctly?
2. Reread your notes. Is there a problem similar that we did together in class?
3. Find a problem similar in your book. Try this one to see if it helps.
4. Skip the problem until the end of Individual Think Time. Then ask an "educated" question of a neighbor or Mrs. Call.

Today we're working by...

