

Name: _____

Math 8

Unit 1: Equations

"I can" Statements

I can solve linear equations in one variable. (8.EE.7)

- I can identify if a linear equation has one, many, or no solutions
- I can solve equations with rational numbers
- I can solve equations that use the distributive property
- I can solve equations that have like terms
- I can solve equations that have variables on both sides

Warm-up: This will be collected and graded

Name: _____

Class: _____

Unit 1: Notes #2 Multi- Step Equations

Date: _____

Equivalent Expressions:

Example 1: Write an equivalent expression for: $4(x - 5)$

Try Its: Write an equivalent expression for:

a) $\frac{1}{5}(2 + x)$

b) $-2.5(2 - 4x)$

Keys to Success:

- 1. Define your variable.**
- 2. Write an expression for each side of the equation.**
- 3. Solve your equation.**
 - a. Distribute to get rid of the parentheses
 - b. Combine like terms (if they are on the same side of the equal sign)
 - c. Get variables on one side of equal sign and #'s on the other
 - d. Inverse operations – undo addition/subtraction first
 - e. Inverse operations – undo multiplication/division last
- 4. Check your solution**
- 5. Make sure you have answered the question(s).**

Example 2: $4x + 3x = 560$

Check:

Try Its: Solve the following equations.

a) $5y + 8y = -39$

b) $2r - 6r + 8 = 40$

Example 3: $2(4x + 3) = 46$

Check:

Try Its: Solve the following equations.

a) $12(2 - x) = 12$

b) $5x + 3(x + 4) = 28$

Example 4: $4x - 3(x - 2) = 21$

Check:

Try Its: Solve the following equations.

a) $22x + 2(3x + 5) = 66$

b) $9x - 5(3x - 12) = 30$

Example 5: The three angles of a triangle are represented by the expressions $3x - 14$, x , and $x + 4$. Recall that the sum of the angles of a triangle is 180° . Write an equation and solve for each angle.

Try It: Write and solve an equation. Only an algebraic solution will be accepted.

a) Sam's father is three times Sam's age. The sum of their ages is fifty-six.

How old is Sam's father?

Notes #3 – Multi-Step Equations w/ Variables on Both Sides – Day 1

Keys to Success:

1. Define your variable.
2. Write an expression for each side of the equation.
3. Solve your equation.
 - a. Distribute to get rid of the parentheses
 - b. Combine like terms (if they are on the same side of the equal sign)
 - c. Get variables on one side of equal sign and #'s on the other
 - d. Inverse operations – undo addition/subtraction first
 - e. Inverse operations – undo multiplication/division last
4. Check your solution
5. Make sure you have answered the question(s).

Example 1: $5n = 3n - 8$

Check:

Try Its: Solve the following equations.

a) $-6y = -4y + 12$

Example 2: $5n + 12 = 9n - 16$

Check:

Try Its: Solve the following equations.

a) $7y - 2 = 5y + 10$

b) $-7x + 15 = -3 + 2x$

Example 3: $4(x + 3) = 2(x - 6)$

Check:

Try Its: Solve the following equations.

a) $3(x + 2) = 4(x - 10)$

b) $-9(c - 4) = -(c + 20)$

Example 4: $4x - 3 + 2x = 8x - 3 - x$

Check:

Try Its: Solve the following equations.

a) $8y + 6 - 12y = 2y + 9 - 3y$

b) $9(w - 4) - 7w = 5(3w - 2)$

Notes #4 – Multi-Step Equations w/ Variables on Both Sides – Day 2

Example 1: $6 + \frac{1}{3}(x - 9) = \frac{1}{2}(2 - x)$

Check:

Try Its: Solve the following equations.

a) $5 - 3(x - 7) = 2(2 - x) - 8$

b) $3x - 0.4(-2x + 5) = 5.6$

Example 2: Nine times the quantity of a number plus four is eight more than five times the number. What is the number?

Try It: Write and solve an equation. Only an algebraic solution will be accepted

Five less than four times a number is nine more than twice the number.

What is the number?

Example 3: Deborah has two paintings in her portfolio and paints three more each week. Kai has twelve paintings in her portfolio and paints two more each week. After how many weeks will Deborah and Kai have the same number of paintings?

Try It: Write and solve an equation. Only an algebraic solution will be accepted

Jake owns twice as many DVDs as Louis. Bo has sixty fewer DVDs than five times Louis's collection. If Jake and Bo have the same amount of DVDs, how many DVDs are in Louis's collection?

Example 4: The square with side length $(x + 3)$ and an equilateral triangle with side length $(3x - 1)$ have the same perimeter.
What is the value of x ?

Try It: Write and solve an equation. Only an algebraic solution will be accepted

A square and an equilateral triangle have the same perimeter. Each side of the triangle exceeds the length of the square by 4 inches. What is the perimeter of the square?

Notes #6 – Special Cases

Warm-up: Solve the following equations.

1. $5(3x + 12) = -15$

2. $6t = 3(t + 4) - t$

Example 1: $6(x - 3) + 10 = 2(3x - 4)$

Check:

Try It: Solve the following equations.

a) $3(6 - 4x) = -2(6x - 9)$

Example 2: $8(4 - 2x) = 4(3 - 5x) + 4x$

Check:

Try It: Solve the following equations.

a) $2(3x + 5) = 5(2x - 4) - 4x$

Directions: Solve the following equations.

1. $\frac{3x}{2} + \frac{x}{5} = 17$

2. $8z - 22 = 3(3z + 11) - z$

3. Lopez spent $\frac{1}{3}$ of his vacation money for travel and $\frac{2}{5}$ of his vacation money for lodging. He spent \$1100 for travel and lodging. What is the total amount of money he spent on his vacation?

4. Cabinet A is 5 inches taller than Cabinet B. Cabinet C is 3 inches taller than Cabinet B whose height is x inches.
Write algebraic expressions for the heights of Cabinets A and C.

If the total heights of the three cabinets is $3x + 8$ inches, can you solve for the height of Cabinet B? Explain.

5. Suppose your club is selling candles to raise money. It costs \$100 to rent a booth from which to sell the candles. If the candles cost your club \$1 each and are sold for \$5 each, how many candles must be sold to equal your expenses?

Equations

<p>Notes #2 Multi-Step Equations</p>	
<p>Notes #3 Multi-Step Equations Variables on both Sides Day 1</p>	
<p>Notes #4 Multi-Step Equations Variables on both Sides Day 2</p>	
<p>Notes #6 Special Cases</p>	