Topic 3: Solve Equations and Inequalities

Term	Meaning	Example
Variable		
Term		
Like Terms		
Coefficient		
Constant		
Inverse Operation		
Proportion		
Equation		
Inequality		
No Solution		
Infinitely Many Solutions		

Lesson 1: Combine Like Terms to Solve Equations

*Goal: Combine **like terms***

*Solve **one- and two-step equations***

The goal in solving equations is to _____.

To do this you will _____.

Practice Examples: (Show your work & _____)

$3x - 2x = -12$

$2.5g - 0.75g = 7$

Dr. McDaniel orders new laptops for some of the math teachers. He orders 4 laptops for the Elementary School, 3 laptops for the Middle School, and 4 laptops for the High School. He received a bill for $7700 for the computers. **Write an equation** and **solve** to find the cost of one computer.

$-3.5y - 6.2y = -87.3$

$-\frac{1}{4}v - \frac{2}{5}v = 39$

Sarah buys a tv on sale for 35% off the original price. If she pays $130 for the tv, **write** and **solve** an equation to determine the original price.

Lesson 2: Solve Equations with Variables on Both Sides

Goal: ***Solve equations*** *with like terms on* ***both sides of the equation***
Make sense of ***real world problems*** *and* ***represent them*** *with equations*

Jonas and Liz are making smoothies that have the same number of liquid ounces. Jonas includes 6 oz. of juice and 4 containers of yogurt, while Liz uses 2 ½ containers of yogurt and 12 ounces of juice. How many ounces of yogurt are in each container?

$7x + 4 = 9x$

$3c - 2 = 8c + 13$

$4r - 18 = 2r + 34$

$15n + 27 = 6n$

$0.5n + 7 = 0.75n + 9$

$14h - 16 = 12h + 2$

Eric and Audrey each earn a salary plus commission selling eyeglasses. Eric earns $800 plus a 7% commission on his sales. Audrey earns $600 plus a 9% commission on her sales. What is the amount of glasses sold so that they earn the same amount?

Lesson 3: Solve Multistep Equations le

*Goal: plan **multiple** solution pathways and **choose one** to **find the solution to a multi-step equation***

Steps to solve ALL equations:

1. Get rid of _____, if they are present by multiplying _____ [but NOT what is in "( )"] by the _____ number.
2. _____ if present. If there is a fraction after _____, then do #1 above.
3. _____, if you need to.
4. _____ - SADMEP

Simplify:

$-(3m + 4) = 8 + 5m - 2$

$-\frac{2}{3}(6y + 18) = 24$

$3 - 4r = 5(r - 3)$

Lesson 4: Equations with No Solutions or Infinitely Many Solutions

*Goal: determine the **number of solutions** to an equation*

Equations can have:

One Solution	No Solution	Infinitely Many Solutions

$4(2x + 1) = 8x$

$12e + 6 = 6(2e + 1)$

$24a - 22 = -4(1 - 6a)$

$2 - 15w = 5(-3w + 2)$

$4(-8x + 5) = -32x - 26$

$8x + 4(4x - 3) = 4(6x + 4) - 4$

Liv rides her bike twice a week. She rides 7 miles round trip to get to Clark Bike Trails, where each trail is 1 ¾ miles long. Mark rides his bike once a week. He rides 0.5 miles round trip to City Bike Trails, where each trail is 3.5 miles long. What is the number of trails that Liv and Mark can ride in one week so that they ride the same number of total miles?

Lesson 5: Solve Two-Step Inequalities

*Goal: Solve a **two-step inequality** and **graph its solution** on a number line*
*Solve an inequality by **multiplying or dividing by a negative rational number***
***Write a two-step inequality** to solve a problem*

You can solve inequalities in the same way you solve equations. You must perform the _____ to _____ the variable.

An _____ is a mathematical sentence that compares quantities. Solving will find a range of values that make it true.

Inequalities

Symbol	<	>	≤	≥
Words				

Since the solution to an inequality is an infinite amount of answers, you need to show those answers on a ***number line***.

You will graph the solution set using a circle at the solution (Border #) and shade in the direction that your inequality indicates.

< _____ **> _____**

The circle depends on the type of inequality

< and > use _____

≤ and ≥ use _____

d + 14 > 12

x + 6 ≤ -9

3r > 12

5g < -15

✪ _____
_____

$-3d < 21$

$\frac{b}{-4} > 2$

$3x + 4 < -16$

$2x - 7 \geq 11$

$3 < -5n + 2n$

$-3 - 6(4x + 6) \geq -111$

$1.3 + 0.2v - 0.8 + 0.6 < -0.7 - 0.1v$

$34 > -16 + \frac{1}{2} c$

Michael spent $20 on supplies for a lemonade stand. He plans to sell each cup of lemonade for $0.50. His neighbor gave him $2 but did not take a cup of lemonade. Write and solve an inequality to find the minimum number of cups of lemonade that Michael must sell in order to make a profit.