

MARCH 14, 2016

**UNIT 5: LINEAR EQUATIONS AND
INEQUALITIES**

**SECTION 6.5:
SOLVING LINEAR
INEQUALITIES BY USING
MULTIPLICATION & DIVISION**

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MATH 9



WHAT'S THE POINT OF TODAY'S LESSON?

We will continue working on the Math 9 Specific Curriculum Outcome (SCO) "Patterns and Relations 4" OR "PR4" which states:

"Explain and illustrate strategies to solve single variable linear inequalities with rational coefficients within a problem-solving context."



What does THAT mean???

**SCO PR4 means MORE ALGEBRA, but
without the equals sign!!!**





WARM-UP

Solve and graph:

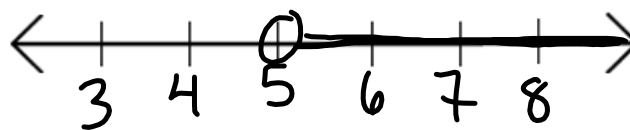
$$5a - 2(a - 3) > 21$$

$$5a - 2a + 6 > 21$$

$$3a + 6 > 21$$

$$3a > 15$$

$$a > 5$$



Extra Practice - Questions???

(page 298, #7, #8 and #9;
page 299, #12 and #14; page 309, #15)

14. $m = \text{muffin}$

a) $m + 3.45 \leq 4.85$

b) $m \leq 1.40$



d) No -
too
expensive.

$$2 > -8$$

$$2 + \underline{2} > -8 + \underline{2}$$

$$4 > -6 \quad \checkmark$$

$$2 > -8$$

$$\underline{2}(2) > \underline{2}(-8)$$

$$4 > -16 \quad \checkmark$$

$$\overset{\text{wavy}}{-2}(2) > \overset{\text{wavy}}{-2}(-8)$$

$$\overset{\text{wavy}}{-2}(-4) > \overset{\text{wavy}}{-2}(16) \quad *$$

$$-4 < 16$$

No!

$$2 > -8$$

$$2 - \underline{2} > -8 - \underline{2}$$

$$0 > -10 \quad \checkmark$$

$$\frac{\underline{2}}{2} > \frac{\underline{-8}}{2}$$

$$1 > -4 \quad \checkmark$$

$$\overset{\text{wavy}}{-2} \frac{2}{2} > \overset{\text{wavy}}{-2} \frac{-8}{2}$$

$$\overset{\text{wavy}}{-2}(-1) > \overset{\text{wavy}}{-2}(4) \quad *$$

$$-1 < 4$$

No!

When each side of an inequality is multiplied or divided by the same **negative** number, the inequality sign must be reversed for the inequality to remain true.

TO SOLVE AN INEQUALITY, we use the same strategy as for solving an equation; however, when we multiply or divide by a negative number, we REVERSE the inequality sign.

Solve the EQUATION:

$$\begin{array}{r} \cancel{-4}x = \cancel{24} \\ \hline \cancel{-4} \quad \quad \cancel{-4} \\ x = -6 \end{array}$$

The equation only has **ONE** solution ($x = -6$).

Solve the INEQUALITY:

$$\begin{array}{r} \cancel{-4}x < \cancel{24} \\ \hline \cancel{-4} \quad \quad \cancel{-4} \\ * \quad * \quad \quad * \\ \downarrow \\ x > -6 \end{array}$$

The inequality has an **INFINITE** number of solutions ($x > -6$).

i) **Solve** the inequality: $-5x - 4 \leq 6$

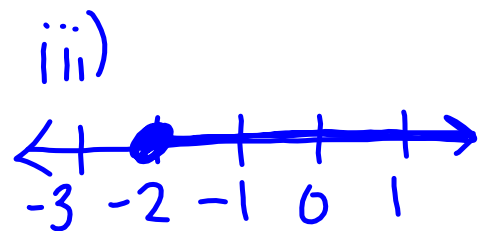
ii) **Verify** the solution.

iii) **Graph** the solution.

$$\begin{array}{r} -5x \leq 10 \\ \hline * -5 \quad \downarrow \quad -5 * \\ x \geq -2 \end{array}$$

ii)

L S	R S
$-5x - 4$	6
$-5(-2) - 4$	
$10 - 4$	
6	



Solve and graph:

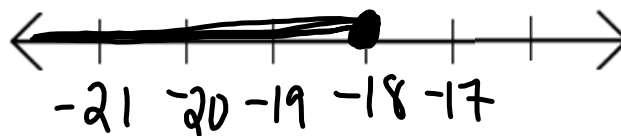
$$8 \leq \frac{2}{-3}x - 4$$

$$12 \leq \frac{2}{-3}x$$

$$\frac{-3}{2} \cdot \frac{6}{1} \leq \frac{-3}{2} \cdot \left(\frac{2}{-3}x \right)$$

$$-18 \geq x$$

$$x \leq -18$$



CONCEPT REINFORCEMENT:

MMS9:

Page 305: #7 TO #12

Page 306: #16 TO #18

Be sure to check your answers in the back of the book as part of your homework. The answers for this section begin on **page 517.**