**MARCH 4, 2016**

# UNIT 5: LINEAR EQUATIONS AND INEQUALITIES

## SECTION 6.4: SOLVING LINEAR INEQUALITIES BY USING ADDITION & SUBTRACTION

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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 <u>MORE</u> ALGEBRA, but without the equals sign!!!**

# WARM-UP: (use fractions)

$$\frac{5x}{6} - 2 = \frac{-x}{4} + 3$$

$$\cancel{12}^{2}\left(\frac{5x}{\cancel{6}}\right) - 12(2) = \cancel{12}^{3}\left(\frac{-x}{\cancel{4}}\right) + 12(3)$$

$$10x - 24 = -3x + 36$$

$$13x - 24 = 36$$

$$13x = 60$$

$$x = \frac{60}{13}$$

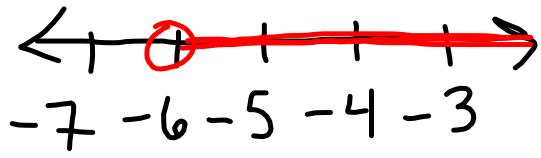
# HOMEWORK QUESTIONS???

## (pgs 292/3, #3 to #6, #9, #10, #13 & #15a)

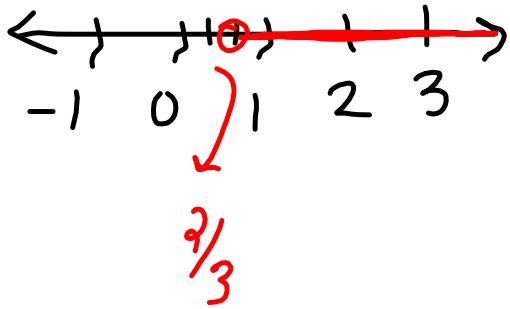
4 cd  cf  ✓

4. c) $y < 0$  d) $m > 0$

13. c) $z > -6$




f) $c > \frac{2}{3}$



# HOMEWORK QUESTIONS???

## (pgs 292/3, #3 to #6, #9, #10, #13 & #15a)

15. a)

| | |
|---|---|
| over | $>$ |
| under | $<$ |
| max | $\leq$ |
| min | $\geq$ |
| at least | $\geq$ |
| no more than | $\leq$ |

Here's an inequality:

$2 < 8$

(Add 2 to both sides.)

$2 + 2 < 8 + 2$

$4 < 10$

Is the new inequality still true?

YES!!!

Here's another inequality:

$7 > 4$

(Subtract 1 from both sides.)

$7 - 1 > 4 - 1$

$6 > 3$

Is the new inequality still true?

YES!!!

**When the same number is added to or subtracted from each side of an inequality, the resulting inequality is still true.**

**For this reason, TO SOLVE AN INEQUALITY, we use the same strategy as for solving an equation: isolate the variable by adding to or subtracting from each side of the inequality.**

**Solve the EQUATION:**

$$x + 6 = 10$$

$$x + 6 - 6 = 10 - 6$$

$$x = 4$$

The equation only has ONE solution ($x = 4$).

**Solve the INEQUALITY:**

$$x + 6 < 10$$

$$x + 6 - 6 < 10 - 6$$

$$x < 4$$

The inequality has an INFINITE number of solutions ($x < 4$).

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

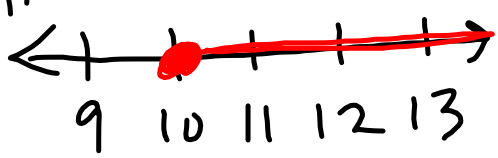
ii) **Verify** the solution.

iii) **Graph** the solution.

$10 \leq x$

$x \geq 10$

iii)




ii)

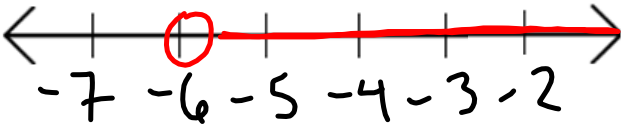
| LS | RS |
|---|---|
| 6 | $x-4$ |
| | $10-4$ |
| | 6 |

## Solve and graph:

1. $-4y + 7 > -5y + 1$

$y + 7 > 1$

$y > -6$




2. $\frac{1}{2}x + 3 \leq \frac{2}{3}x - 4$

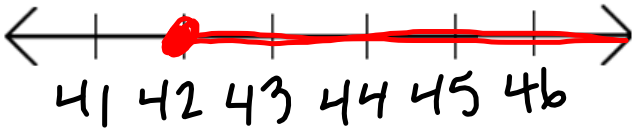
$6\left(\frac{1}{2}x\right) + 6(3) \leq 6\left(\frac{2}{3}x\right) - 6(4)$

$3x + 18 \leq 4x - 24$

$18 \leq x - 24$

$42 \leq x$

$x \geq 42$



Jake plans to board his dog while he is away on vacation.

* Boarding house A charges $90 plus $5 per day.
* Boarding house B charges $100 plus $4 per day.

For how many days must Jake board his dog for boarding house A to be less expensive than boarding house B?

a) Write an inequality that can be used to solve this problem.

b) Solve the problem.

c) Graph the solution.

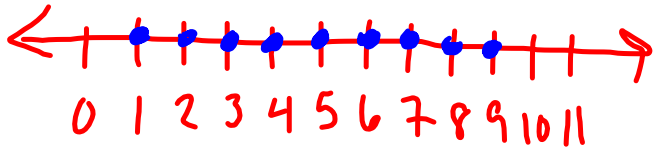
d) Check your solution on page 297 of the textbook.

a / b) $90 + 5d < 100 + 4d$

$90 + d < 100$

$d < 10$ days $(9, 8, 7 \ldots 1)$

c)



**OPTIONAL PRACTICE FOR MARCH BREAK: (Optional, but you do have a unit test on Wed., March 16 to be thinking about and preparing for...)**

***MMS9*:**

**Page 298: #7 to #9**

**Page 299: #12 and #14**

**Page 309: #15**

**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 516.**