Name:_____ Notes #12

multi-step inequalities

Review: Solve the inequality and number line, and then explain the solution.
$-4\mathrm{p} + 28 > 8$

using the distributive property

When we distribute, _____ the outside number by BOTH terms inside the parentheses!

1) $4(1 - 2t) > 28$

2) $36 \geq 4(2m + 10)$

multi-step Inequalities

***Remember: You are always using the same steps as solving an _____.

But you must _____the inequality sign when multiplying or dividing by a _____!

Step 1: Draw a _____ down from the _____ _____.

Step 2: _____ if needed.

Step 3: Combine _____ _____ .

Step 4: _____ the variable.

Step 5: Undo any _____ or _____.

Step 6: Undo any _____ or _____.

Step 7: _____ each step.

Try-it!! Solve, graph and then explain the solution.

3) $2t + 4 - 3t \geq -1$

4) $4(w - 2) - w \leq -10$

5) $4(1 + 2t) > 28$

6) $24 > 3(x + 2)$

7) $2n - 3(n + 3) \leq 14$

8) $3s + 16 - 4s < 7$

Name:_____ Notes #13

Inequalities with Variables on Both Sides

Review: Fill in the blanks.

Steps for Variables on Both Sides:

Step 1: Draw a _____ down from the inequality sign to separate the two sides.

Step 2: _____ if needed.

Step 3: Combine _____ _____ on each side **separately** if needed.

Step 4: _____ the terms with the variable.

Step 5: Move the _____ variable to the other side by doing the _____.

Step 6: Undo any _____ or _____.

Step 7: Undo any _____ or _____.

Step 8: _____ each step.

1) $6z - 15 < 4z + 11$

2) $-3(v - 3) \geq 5 - 4v$

3) $2m - 3 < 4m + 5$

Try-it!!! Solve *and* Graph the number line

4) $3w + 2 < 2w + 5$

5) $3x + 2 > -4x + 16$

6) $3(-4 + m) \geq 8m - 28$

7) $3(q + 2) \leq -5q - 10$

Name:_____ Notes #14

Inequalities with Decimals & Fractions

Review: Solve the following, number line and then explain the solution:

$r + 3 > 5r + 19$

When an inequality has _____ and _____, not much changes!

USE YOUR CALCULATOR!!! IT IS YOUR FRIEND!

Convert all fractions to decimals first **if you can.**

If a fraction is attached to your variable (and it **can't** be converted to a decimal), _____

both sides of the inequality by the _____ to get rid of it. (_____!)

Solve the following inequalities, number line and explain.

1) $5\frac{1}{2} \leq \frac{1}{4}x + 5$

2) $0.02y + 200 < 0.03y + 350$

3) $\frac{5}{6} \leq \frac{2}{3}x + \frac{1}{2}$

TRY IT!!!!

4) $0.02x + 0.7 \geq 0.8$

5) $0.35x + 0.6 \leq 0.1x + 1$

6) $2(x - 3) > 1.2 - x$

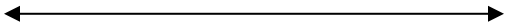
7) $\frac{1}{16}x + \frac{1}{4} < \frac{1}{2}$

Name: _____ Notes #15

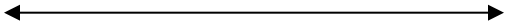
Inequality Review

Solve the inequality and number line the solution. Then <u>DESCRIBE</u> the solution set.

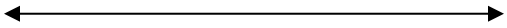
1. $t - 12 \geq 8$



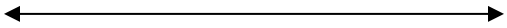
2. $4k < 24$



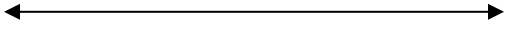
3. $16 \leq h + 9$



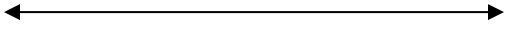
4. $\frac{a}{-5} > 2$



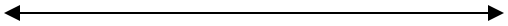
5. $12 \geq -4x - 4$



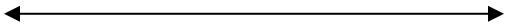
6. $2m + 6 \leq 16$



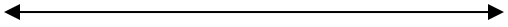
7. $-5a - 10 \geq 20$



8. $-\frac{x}{4} + 2 < 3$



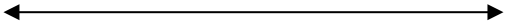
9. $8(1 + 2x) < 32$



10. $6x + 2 \leq 2x + 6$

11. $0.3w + 4.2 > 7.3 + 3.9w$

12. $\frac{1}{7}x - 8 > -12$



Name:_____ Notes #16

Compound Equations

Exercise 1

Determine whether each claim given below is true or false.

a. Right now, I am in math class and English class.

b. Right now, I am in math class or English class.

c. $3 + 5 = 8$ and $5 < 7 - 1$.

d. $10 + 2 \neq 12$ and $8 - 3 > 0$.

These are all examples of declarative compound sentences.

e. When the two declarations in the sentences above were separated by "and," what had to be true to make the statement true?

f. When the two declarations in the sentences above were separated by "or," what had to be true to make the statement true?

Example 1

Solve each system of equations. Then number line the solution

a. $x + 8 = 3$ or $x - 6 = 2$

b. $4x - 9 = 0$ or $3x + 5 = 2$

c. $x - 6 = 1$ and $x + 2 = 9$

d. $3x + 2 = 8$ *and* $-4x - 2 = -10$

e. $5x - 8 = -23$ or $x + 1 = -10$

f. $x - 9 = 0$ or $x + 15 = 0$

Name:_____ Notes #17

Compound -AND- Inequalities

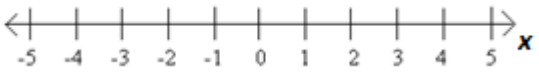
Determine if each sentence is true or false. Explain your reasoning.

a. $8 + 6 \leq 14$ and $\frac{1}{3} < \frac{1}{2}$.

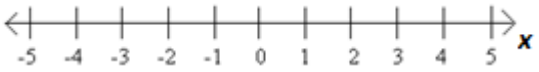
b. $5 - 8 < 0$ or $10 + 13 \neq 23$

1.)

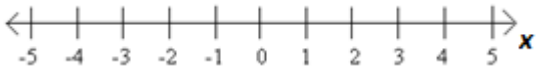
a. Using a colored pen, pencil or highlighter, graph the inequality $x < 3$ on the number line below.



b. Using a different colored pencil, graph the inequality $x > -1$ on the number line below.

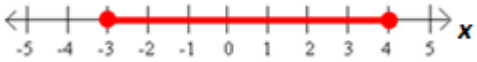


c. Using a third colored pencil, darken the section of the number line where $x < 3$ and $x > -1$.

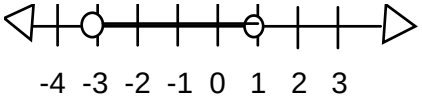


2.) Write a compound inequality for each graph.

a.



b.



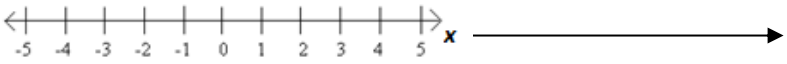
c. Rewrite as a compound sentence and graph the sentence on a number line.

$1 \leq x \leq 3$

Solve the compound inequality and graph the solution(s) to each of the following on a number line.

3.) $x < 9$ and $x > 7$

4.) $-10 < p + 2 < 2$



<u>Try It!</u> Solve each compound inequality. Graph its solution set.

5.) $y + 4 > 1$ and $y + 2 < 1$

6.) $-8 < h + 2 < 2$

Name:_____ Notes #18

COMPOUND -OR- INEQUALITIES

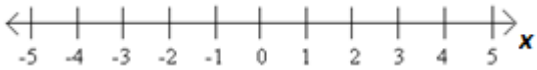
Determine if the following are true or false.

a. $3 < 5 + 4$ or $6 + 4 = 9$.

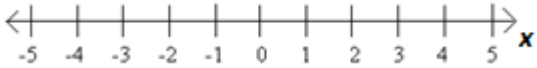
b. $16 - 20 > 1$ or $5.5 + 4.5 = 11$

Exercise 1

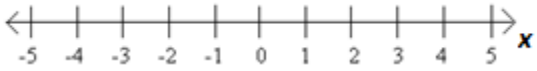
a. Using a colored pencil, graph the inequality $x < -4$ on the number line below.



b. Using a different colored pencil, graph the inequality $x > 0$ on the number line below.



c. Using a third colored pencil, darken the section of the number line where $x < -4$ *or* $x > 0$.



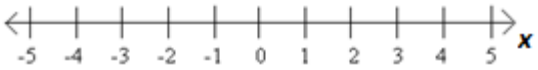
Example 2: Write a compound inequality for each graph.

a.

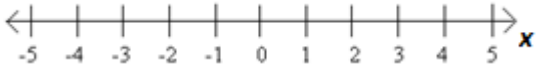
b.

Example 3: Graph each compound sentence on a number line.

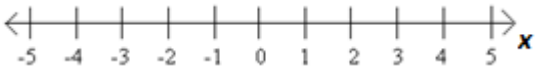
a. $x \leq -5$ or $x \geq 2$



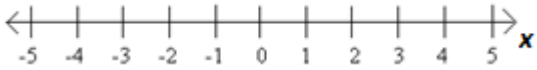
b. $x + 4 < 2$ or $x - 2 > 1$



c. $3c + 4 \geq 13$ or $6c - 1 < 11$



d. $12 + b \geq 16$ or $b + 9 < 11$



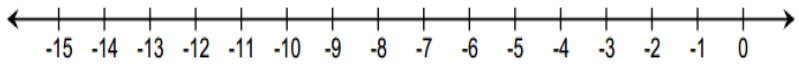
Name:_____ Notes 19

COMPOUND INEQUALITIES WITH NO SOLUTION

Review:

Solve the compound inequality, graph on a number line, and write describe the solution:

$-10 < x + 2 \leq -1$



When we graph compound inequalities separated by *AND*, our solution is where

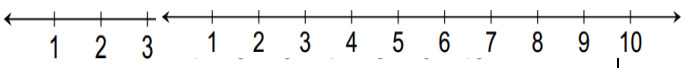
the inequalities _____.

If we graph a compound inequality separated by *AND* , and the inequalities do not

_____, then there is _____.

Name a number that is in the solution:

$x \geq 3 \; and \; x < 7$

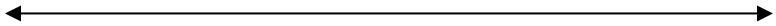


$x > 5 \; and \; x < 2$

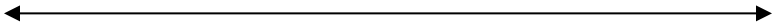
Solve the following inequalities, graph on a number line, and describe the solution:

1. $7 - 3x < 16 \quad and \quad x + 12 < -8$

2. $8 \leq 2(x - 3) < 4$



3. $\frac{p}{2} < 5 \; and \; \frac{p}{3} \geq 4$

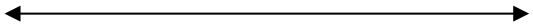


Name: _____ Notes #20

Compound Inequalities Review

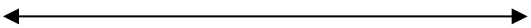
Solve and then graph the solution set.

1. $n - 10 \geq 0$ or $-5 + n < -6$

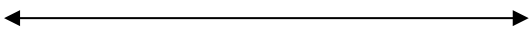


2. $x + 1 \geq 3$ or $x + 6 < 4$

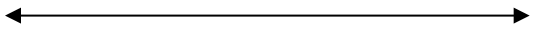
3. $\frac{v}{2} \leq 0$ and $v - 2 > -10$



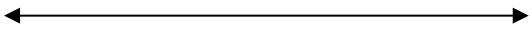
4. $28 < 9k + 1 < 55$



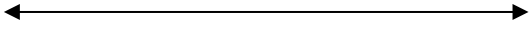
5. $6y > -36$ or $-3y \geq 24$



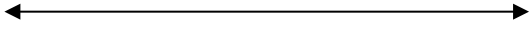
6. $b + 7 < 11$ or $9 + b \geq 16$



7. $2 < 2t < 10$

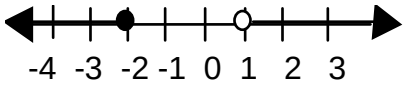


8. $7 + m \geq 2$ and $m + 1 < 2$



Name _____ Foundations Homework #18

Write a compound inequality for each solution set shown below.

1. 

Solve the compound inequality and graph its solution.

2. $b - 2 > 18 \; or \; 3b < 54$

3. $3j \geq 6 \; or \; 3j \leq -6$

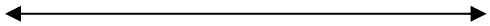
4. $7 + 2a > 9 \; or \; -4a > 8$

5. $6x > -36 \; or \; 3x \leq -24$

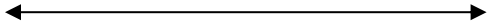
Name _____ Foundations Homework #17

Solving a compound "AND" inequality

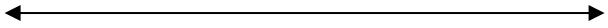
1) $m + 2 > 2$ and $m - 4 < 2$



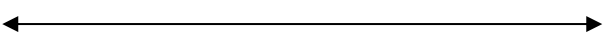
2) $-5 < k + 3 \leq 3$



3. $2a + 7 < 9$ *and* $a + 5 > 2$



4. $-4b > 8$ *and* $2b > -6$



Name:_____ Homework #16

Solve the following compound equations and number line the solution.

1.) $-2x - 3 = -9 \; or \; 5x - 7 = 13$

2.) $3x - 6 = 12 \;\; and \; 4x + 2 = 26$

3.) $-7x + 2 = 16 \; and \;\; 3x - 5 = -11$

4.) $6x - 1 = 5 \;\; or \;\; -2x - 3 = 7$

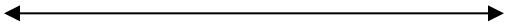
Name: _____ Homework 15

Solve the following inequalities. Number line and EXPLAIN the solution.

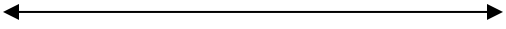
1. $2(m + 3) \leq 16$

2. $8n - 10 < 6 - 2n$

3. $6t + 12 > 8 + 8t$



4. $3(d - 2) > 16 + 2d$



Name:_____ Homework #14

Solve the following inequalities. Then number line and EXPLAIN the solution.

1.) $0.6m + 3 \leq 2m + 0.2$

2.) $0.6(n + 10) > 3.6$

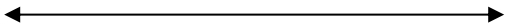
3.) $\frac{3}{5}(x + 2) \leq x - 4$

4.) $\frac{1}{2}w + 7 \geq 2w - 2$

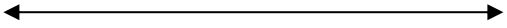
Name: _____ Homework #13

Solve the inequality and graph its solution. Then describe the solution.

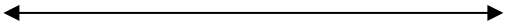
1. $5 + 4x \geq x + 8$



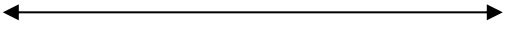
2. $3z + 7 < 2z + 10$



3. $12 + 4m \geq 8m - 8$



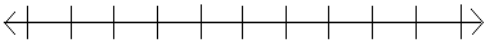
4. $3(x - 2) - 2x > 4x + 9$



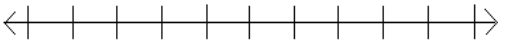
Name: _____ Homework #12

Solve the following inequalities. Then number the line and EXPLAIN the solution.

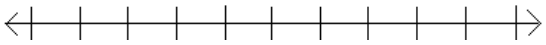
1) $3(d + 2) > 6$



2) $26 \geq 2(m + 10)$



3) $18 > 2m + 6 - 5m$



4) $2(b - 3) - 4b \geq 4$