

Name: \_\_\_\_\_

Date: \_\_\_\_\_

**10.1 NOTES: Solving Linear Inequalities (in 1 Variable)**

Algebra 1

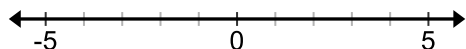
**Warm-up:**

Inequality	Graph
$x \geq 5$	
Meaning:	
$x > -3$	
Meaning:	
$x < 0$	
Meaning:	
$m \leq 1.4$	
Meaning:	
$-6 \geq n$	
Meaning:	
$j = -4$	
Meaning:	

## I. Equations vs. Inequalities:

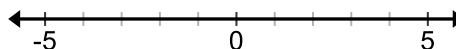
Solve the following equation and graph the solution set.

$$15 = -3x + 7 + 5x$$



Solve the following inequality and graph the solution set.

$$15 > -3x + 7 + 5x$$



What is the largest rational number in the solution set?

What is largest integer in the solution set?




When solving inequalities we use the same properties as solving \_\_\_\_\_ . However, in general, there is only \_\_\_\_ solution to an equation. In contrast, there are usually \_\_\_\_\_ solutions to an inequality. These solutions are often represented using a graph on a number line. When graphing inequalities it is helpful to have the variable on the \_\_\_\_\_ .

II. Special Inequality Rule: \_\_\_\_\_

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Solve and graph the following inequality.

<b>Incorrect</b>	<b>Correct</b>	<b>Alternative</b>
$-5x + 7 > 42$	$-5x + 7 > 42$	$-5x + 7 > 42$
		
Check:	Check:	Check:

**III. Solve and graph the following inequalities.**

1.  $8x + 5 > -15$



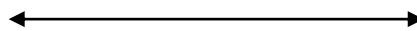
2.  $12 - 5x \geq 30$



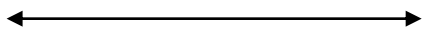
3.  $\frac{-1}{3}n < 10$



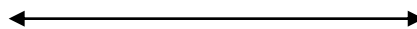
4.  $-4 \leq \frac{1}{4}g - 14$



5.  $6x - 3 < 7 + 4x$



6.  $-2(x - 4) \leq 6$



$$7. \quad 7 - \frac{2}{3}x < x - 8$$



$$8. \quad \frac{1}{5}x > 9 + \frac{1}{4}x$$



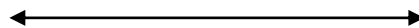
#### IV. All Real Numbers or No Solution:

Inequalities with variables on both sides sometimes yield solutions of ALL REAL NUMBERS or NO SOLUTION. Attempt to solve the following inequalities and graph the solutions.

$$1. \quad x + 4 > x + 2$$



$$2. \quad 2b - 1 < -2 + 2b$$



**Error Analysis:**

Julia and Elena are solving  $6d \geq -84$ . Is either of them correct? Explain your reasoning.

Julia
$6d \geq -84$
$\frac{6d}{6} \geq \frac{-84}{6}$
$d \geq -14$

Elena
$6d \geq -84$
$\frac{6d}{6} \geq \frac{-84}{6}$
$d \leq -14$

Who is correct? \_\_\_\_\_

Explanation: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Word Problem:**

Luther earns a \$25 allowance each week for doing chores around the house and helping to babysit his sister. He also earns \$11 per hour working at a coffee shop.

- Write an inequality to represent the number of hours,  $x$ , Luther must work at the coffee shop in order to earn a minimum of \$200 per week.
- What is the minimum number of whole hours Luther must work?

**Aug 2015 Regents Question:**

Given  $2x + ax - 7 > -12$ , determine the largest integer value of  $a$  when  $x = -1$ .