Algebra 9:

March 23-27

Time Allotment: 40 minutes per day

Student Name: _____

Teacher Name: Mrs. Hudson

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Chapter 10: Inequalities

Packet Overview

Date	Objective(s)	Page Number
Monday, March 23	Chapter 10-1: Order of Real Numbers	2-4
Tuesday, March 24	Review: Solving Linear Equations	5-6
Wednesday, March 25	Chapter 10-2: Solving Inequalities	7-9
Thursday, March 26	Chapter 10-2: Solving Inequalities Continued	10-12
Friday, March 27	Study 10-1 and 10-2 Quiz on Lessons 10-1 & 10-2	Packet M-Th 13-14

Additional Notes:

- **Materials:** Printed packet or notebook paper; pencils. (Calculators not needed).
  - **Note:** If you are using notebook paper, be sure to write the pages and numbers of the material.
  - **Example:** P. 3; #3a) _____
- **Answers are given at the end of each assignment.**
- **Quiz:** Located on pages 13-14. This should be taken ***without*** looking at previous work. No answers are provided for the quiz.

Academic Honesty

I certify that I completed this assignment independently in accordance with the GHNO Academy Honor Code.

Student signature:

_____

I certify that my student completed this assignment independently in accordance with the GHNO Academy Honor Code.

Parent signature:

_____

Monday, March 23

Algebra Unit: Inequalities

Unit Overview: Inequalities

We are now starting Chapter 10, Inequalities. In this chapter, you will:

1) Review the concept of order and to graph inequalities in one variable,
2) Transform inequalities in order to solve them,
3) Solve problems that involve inequalities,
4) Find the solution sets of combined inequalities,
5) Solve equations with inequalities involving absolute value,
6) Extend your skill in solving open sentences that involve absolute value,
7) Graph linear inequalities in two variables,
8) Graph a solution set of a system of two linear inequalities in two variables.

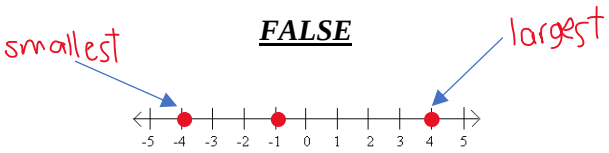
Lesson 10-1: Order of Real Numbers

Objective: Be able to review the concept of order and to graph inequalities in one variable.

Reminder:

$<$ ***is less than***; $\leq$ ***is less than or equal to***; $>$ ***is greater than***; $\geq$ ***is greater than or equal to***

- **Let's begin! You can fold the page so that you cannot see the answers/explanations and try to answer examples 1 & 2. Then, use examples 3 & 4 on the left to help you complete the questions on the right.**

Ex. 1) True or False?	Answer for example 1)
$4 > -4 > -1$	***FALSE***  So, it should be $-4 < -1 < 4$

Ex. 2) True or False? a) $5 \leq 5$ b) $6 \leq 5$ c) $-2 < -8$ d) $\lvert -2 \rvert < \lvert -8 \rvert$	Answers for example 2) a) TRUE… $\leq$ *means less than OR equal to* so 5 is equal to 5. b) FALSE… 6 is not less than 5 or equal to 5 c) FALSE… make a number line to see this clearly d) TRUE… The absolute value means how far a number is from zero. -2 *is* 2 spaces from zero and -8 *is* 8 spaces from zero. Hence, $2 < 8$ (Two is less than 8).
Ex. 3) Translate each statement into symbols: Answers are in RED. a) -5 *is less than* -3: $-5 < -3$ b) 6 *is greater than or equal to* 2: $6 \geq 2$ c) 0 *is greater than* $-\frac{1}{2}$ *and less than* 1: $-\frac{1}{2} < 0 < 1$ d) 5 *is between* -9 *and* 9: $-9 < 5 < 9$ e) -1.5 *is less than* -1 *and* -1 *is less than* 2: $-1.5 < -2 < 2$ f) *The number n is less than* 20: $n < 20$	3) Your turn… Translate each statement into symbols: a) 4 *is greater than* -7: b) -12 *is less than or equal to* -9: c) 3 is greater than 2 and less than 3.5: d) -8 *is between zero and* -10: e) 4.6 *is greater than* 4 *and* 4 *is greater than zero*: f) *The number n is greater than* 10:

Ex. 4) Classify each statement as true or false:	4) Your turn:
a) $0 \leq \lvert -2 \rvert$ $0 \leq 2$ TRUE	a) $\lvert -3 \rvert > -3$
b) $\lvert -0.5 \rvert \leq -0.5$ $0.5 \leq -0.5$ FALSE	b) $\lvert -25 \rvert < \lvert -10 \rvert$
c) $-6 < 1 < 8$ TRUE	c) $\left\lvert -\frac{1}{2} \right\rvert \geq 0$
d) $-5 < -4 < 4$ TRUE	d) $6 > 0 > 2$

ANSWERS:
3) a) $4 > -7$ b) $-12 \leq -9$ c) $2 < 3 < 3.5$ d) $-10 < -8 < 0$ e) $0 < 4 < 4.6$ f) $n > 10$
4) a) True b) False c) True d) False

Tuesday, March 24

Algebra Unit: Inequalities

Lesson: Review solving linear equations

Objective: Be able to solve linear equations in order to solve inequalities in 10-2.

- In order to solve inequalities, we need to review solving linear equations.

- Example:

$2(w-8)+9$	$=$	$3(4-w)-4$	(1) PE***M***DAS on left = PE***M***DAS on right
$2w-16+9$	$=$	$12-3w-4$	(2) PEMD***AS*** on left = PEMD***AS*** on right
$2w-7$	$=$	$8-3w$	(3) ***SA***DMEP
$+7$	$=$	$+7$	
$2w$	$=$	$15-3w$	(4) ***SA***DMEP
$+3w$		$+3w$	
$5w$	$=$	15	(5) SA***DM***EP
$\div 5$		$\div 5$	
w	$=$	3	

- Solve the following equations. Be sure to SHOW STEPS.
- Check your answers at the end of today's lesson.

1) $y+14=-33$	2) $23-y=47$
3) $(e+4)+3=9$	4) $126=-9w$
5) $-\frac{m}{3}=-40$	6) $-\frac{3}{2}=-9z$

7) $\frac{1}{4}v = 2\frac{3}{4}$

8) $-3 + 3m = -45$

9) $\frac{n}{5} + 9 = -11$

10) $x - 5 - 6x = -25$

11) $0 = y - 14 - 3y$

12) $2(v + 7) - 9 = 19$

13) $x = 45 - 4x$

14) $7y - 3 = 6(y + 2)$

ANSWERS: (1) {-47} (2) {-24} (3) {2} (4) {-14} (5) {120} (6) $\{\frac{1}{6}\}$ (7) {11}
(8) {-14} (9) {-100} (10) {4} (11) {-7} (12) {7} (13) {9} (14) {15}

Wednesday, March 25

Algebra Unit: Inequalities

Lesson 10-2: Solving Inequalities… continued!

Objective: Be able to transform inequalities in order to solve them.

- Great news, solving inequalities is very similar to solving linear equations!
- There is **ONE** additional thing to know, but I am not sharing it yet 😊.
- In the chart, solve each inequality (on the left) the same way you would solve linear equations (yesterday's assignment).
- Then, plug in TWO numbers to check your answer. I will complete the first two.

SOLVE	CHECK
1) $2v + 1 > 7$ $-1 \quad -1$ $2v \quad > 6$ $\div 2 \quad \div 2$ $v \quad > 3$	$2v + 1 > 7$ $\quad 2v + 1 > 7$ $\quad 2v + 1 > 7$ $2(3) + 1 > 7 \quad 2(4) + 1 > 7 \quad 2(100) + 1 > 7$ $6 + 1 > 7 \quad 8+1 > 7 \quad 200 + 1 > 7$ $7 > 7 \quad 9 > 7 \quad 201 > 7$ False $\quad$ True $\quad$ True ❖ I got excited and plugged in three numbers ❖ So, the answer can be anything greater than 7, even 7.000001 is greater than 7.

- Your turn! Try the next questions but BE CAREFUL. **Make sure you check your answers!** I want you to discover the ONE change from solving linear equations.

SOLVE	CHECK
2) $3f - 4 \leq 5$	
3) $5r < 2r + 12$	
4) $-5w \leq -15$	
5) $-\frac{d}{3} \geq 1$	

- When you checked your answers, did they come out correctly?
- What did you notice? _____
- Let's take a look at #4:

4) $-5w \leq -15$ $\div(-5) \quad \div(-5)$ $w \leq 3$	Let's plug in numbers less than or equal to 3, like 3, 2, 1, 0, -1, -3.75… I am plugging in 3, 2, and -1: $-5w \leq -15$ $-5w \leq -15$ $-5w \leq -15$ $-5(3) \leq -15$ $-5(2) \leq -15$ $-5(-1) \leq -15$ $-15 \leq -15$ $-10 \leq -15$ $5 \leq -15$ TRUE FALSE FALSE Wait, shouldn't they all be TRUE??

- Okay, here is the new transformation that produce an equivalent inequality. ARE YOU READY?

  - ***If you are <u>multiplying (or dividing)</u> BOTH SIDES of the inequality by the same <u>NEGATIVE number</u>…***
  - ***You have to reverse the direction of the inequality!***
    - ***In other words, <u>FLIP THE SIGN!</u>***

So, the answer to #4 should have been $w \geq 3$!

- Now that you know the NEW RULE, solve each inequality:

1) $\frac{x}{2} - 4 > -6$	2) $3 \geq 2k - 7$
3) $4 - \frac{u}{2} \leq -4$	4) $3f - 4 < 2f + 5$

5) $5(1-t) > 4(3-t)$	6) $4(2-v) \geq -(v-5)$
7) $\frac{5}{6}r + 1 \geq \frac{4}{3}$	8) $\frac{3}{4} < 6 - \frac{1}{2}a$

You did it! Fractions are our FRIENDS!

Be sure to check your answers.
If your answer is incorrect, then find your mistake, ask your parents, call a friend, or email me!

Answers : (1) $x > -4$ (2) $5 \geq k \text{ or } k \leq 5$ (3) $u \geq 16$ (4) $f < 9$
(5) $t < -7$ (6) $v \leq 1$ (7) $r \geq \frac{2}{5}$ (8) $a < \frac{21}{2}$

Thursday, March 26

Algebra Unit: Inequalities

Lesson 10-2: Solving Inequalities… continued!

Objective: Be able to transform inequalities in order to solve them.

- Hello! Today we will continue with 10-2.
- When we have inequalities, we can represent the answers on a number line.

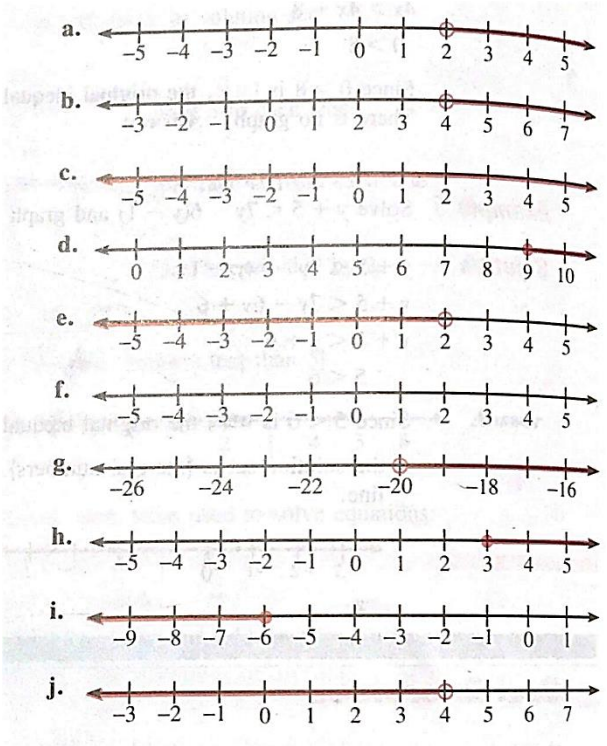
For example:

Ex. 1) $x > -1$ In words, x is greater than -1. 	Ex. 2) $x \leq 3$ In words, x is less than or equal to 3. 

- Example 1 shows us that all numbers greater than -1 work in the inequality, even 1.25 or -0.5, but NOT -1. The circle is OPEN, since -1 WILL NOT WORK.
- Example 2 shows that 3 and anything smaller, 2, 1, 0.5, -1…, will work. The circle is CLOSED (colored) because 3 WILL WORK.

Solve the following inequalities and then write the letter of the graph.

1) _____ $y - 2 \geq 7$
2) _____ $10 < z + 8$
3) _____ $6p < 24$
4) _____ $18 \leq 6v$
5) _____ $-28 > -7m$
6) _____ $\frac{d}{2} > -10$
7) _____ $2 - g > 0$
8) _____ $3 \leq \frac{x}{-2}$
9) _____ $b - 1 < b - 2$
10) _____ $t + 2 > t + 1$

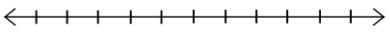
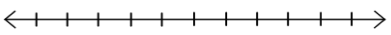
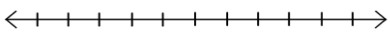
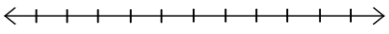
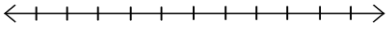
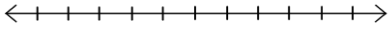
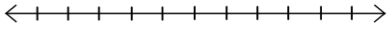
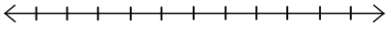
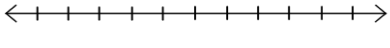


- Solve these inequalities and graph the answers in the boxes provided.

24. $5v + 3 > 18$ **25.** $48 - 6y < 0$ **26.** $7n < 6n + 8$

27. $8f - 5 > 4f + 11$ **28.** $-6(v - 3) \leq 42$ **29.** $5(m + 2) > 4(m - 1)$

30. $\frac{4}{9}h + 3 \leq \frac{1}{3}$ **31.** $2(w - 1) < \frac{3}{2}w$ **32.** $2x - \frac{1}{4}(3x + 8) > 0$

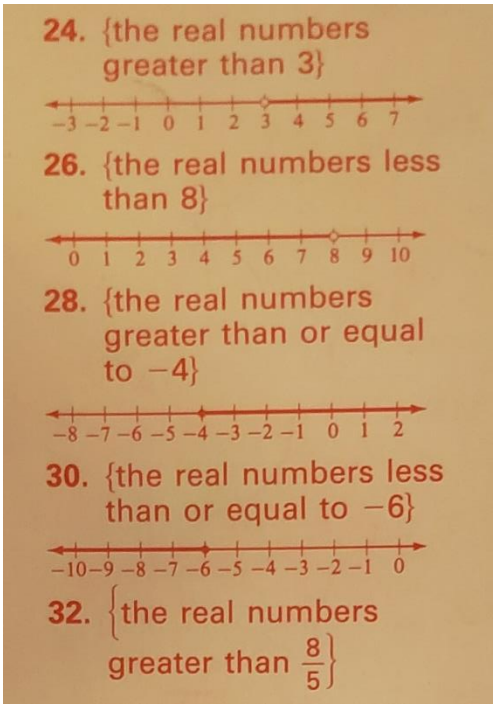
24) 	25) 	26) 
27) 	28) 	29) 
30) 	31) 	32) 

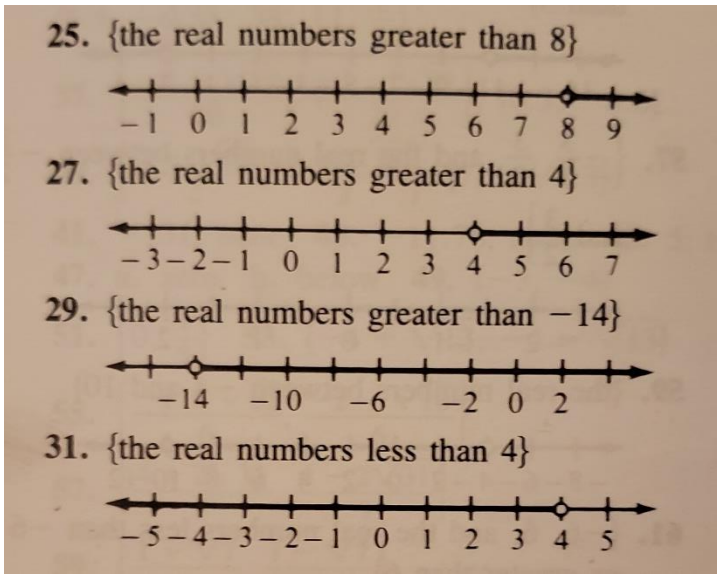
Algebra 1: Inequalities
March 23-27

QUIZ tomorrow!

Today's answers:

1) d 2) a 3) j 4) h 5) b 6) g 7) e 8) i 9) f 10) c





Friday, March 27

Algebra Unit: Inequalities

Lesson: Review 10-1 and 10-2 and take a quiz

Objective: Be able to graph inequalities in one variable and transform inequalities in order to solve them.

- Go back in this packet and study the material. For example, re-do several problems from each lesson, especially those that are tricky for you! (You can email me if you need assistance)!
- When you are ready, put the packet away and take the quiz.

STOP…This is a quiz. No other material should be out. PENCIL only 😊.
NOTE: If this is not printed, use loose leaf paper and label the numbers and answers clearly.

Translate each statement into symbols:

1) -5 *is greater than or equal to* -8	2) -3 *is between* 1 *and* -5

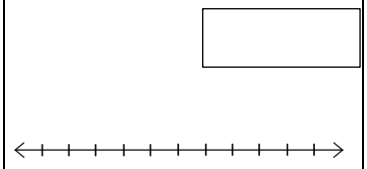
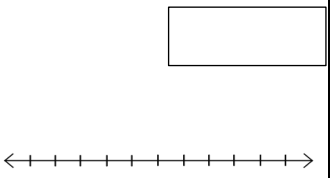
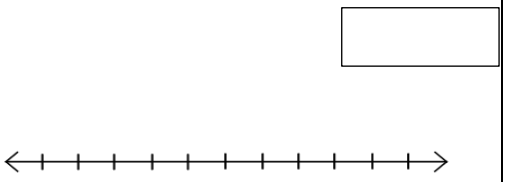
Classify each statement as true or false:

3) $-8 > 7 > 6$	4) $-5 < -4 < 5$	5) $-10 < -15 < -20$

Solve the following equations:

6) $4x = -\frac{2}{3}$	7) $-4(n-6) = 36$
8) $m - 5 = \frac{1}{2}(12 - 14m)$	9) $3(x-4) = 6(x-3)$

Solve each inequality and graph its solution set:

10) $5 - 3t \leq 20$	11) $\frac{x}{2} + 5 < 1$	12) $5(v - 1) > 3(v + 4) - 5$
		

Great Job!
Have a great weekend!