

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Period: \_\_\_\_\_

## Notes Day 2 Inequalities Vocabulary & Interval Notation

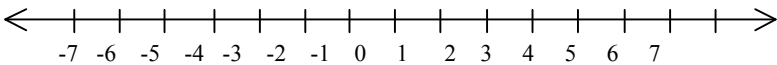
**Interval Notation:** Start at the \_\_\_\_\_ point and end at the \_\_\_\_\_ point. The smallest number possible is \_\_\_\_\_ and the largest is \_\_\_\_\_. To indicate that a value is included use a \_\_\_\_\_, to indicate that a value is not included use a \_\_\_\_\_.

### Inequality Vocabulary

1. = : **equal to** (graph with a shaded circle)

A. Ex.  $x = 2$

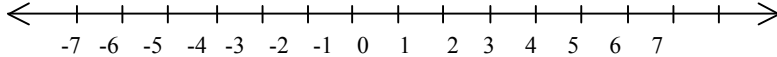
B. Written: \_\_\_\_\_ Interval Notation: \_\_\_\_\_

C. Graph: 

2.  $\neq$  : **not equal to** (graph with an open circle and shade in both directions)

A. Ex.  $x \neq 2$

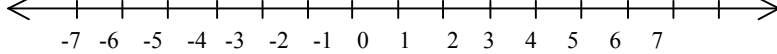
B. Written: \_\_\_\_\_ Interval Notation: \_\_\_\_\_

C. Graph: 

3. < : **Less Than** (graph with an open circle and shade to the left)

A. Ex.  $x < 3$

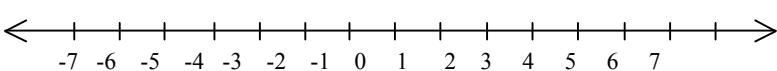
B. Written: \_\_\_\_\_ Interval Notation: \_\_\_\_\_

C. Graph: 

4.  $\leq$  : **less than or equal to** (graph with a shaded circle and shade to the left)

A. Ex.  $x \leq 4$

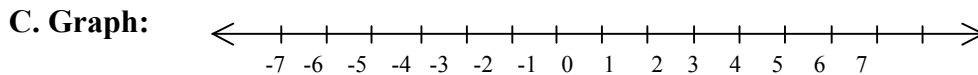
B. Written : \_\_\_\_\_ Interval Notation: \_\_\_\_\_

C. Graph : 

5.  $>$  : **Greater than** (graph with an open circle and shade to the right)

A. Ex.  $x > -3$

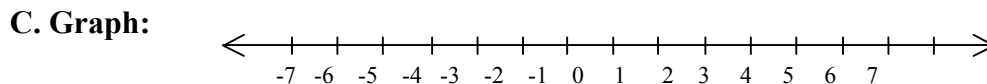
B. Written: \_\_\_\_\_ Interval Notation: \_\_\_\_\_



6.  $\geq$  : **Greater than or equal to** (graph with a shaded circle and shade to the right)

A. Ex.  $x \geq -2$

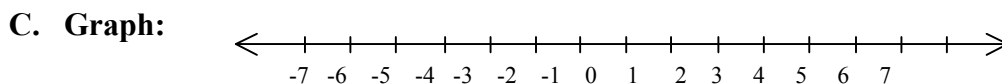
B. Written: \_\_\_\_\_ Interval Notation: \_\_\_\_\_



7. **Between** - the numbers from the smallest endpoint to the largest endpoint, **NOT INCLUDING** the endpoints

A. Ex:  $-1 < x < 4$

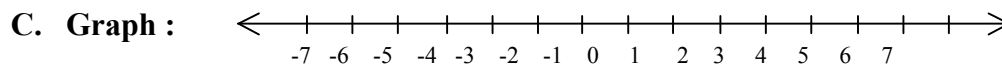
8. Written: \_\_\_\_\_ Interval Notation: \_\_\_\_\_



9. **Inclusive**: the numbers from the smallest endpoints to the largest endpoints **INCLUDING** the endpoints.

A. Ex:  $-1 \leq x \leq 5$

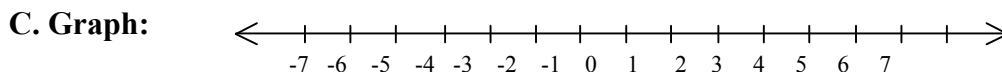
B. Written: \_\_\_\_\_ Interval Notation: \_\_\_\_\_



9. **No More Than/At Most**: all numbers smaller than and including the endpoint

A. Ex:  $x \leq 5$

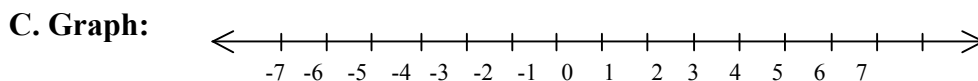
B. Written: \_\_\_\_\_ or \_\_\_\_\_ Interval Notation: \_\_\_\_\_



10. **At Least**: all numbers greater than and including the endpoint

A. Ex:  $x \geq 4$

B. Written: \_\_\_\_\_ Interval Notation: \_\_\_\_\_



## Day 3 Notes – Solving One-Step Equations

An open sentence that contains \_\_\_\_\_ is an \_\_\_\_\_.  
 The \_\_\_\_\_ to an inequality is a \_\_\_\_\_ instead of just one solution.

*To solve an inequality with adding or subtracting*

1. \_\_\_\_\_ like you would a normal equation.
2. \_\_\_\_\_ your answer.
3. \_\_\_\_\_ the inequality on a number line.

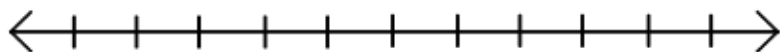
**EXAMPLE 1:** Solve  $x - 12 \geq 8$ .

**Step 1:**

The solution is the set {all numbers greater than or equal to \_\_\_\_\_}

**Step 2:** To check, \_\_\_\_\_ three different values into the original inequality; 20, a number less than 20, and a number greater than 20.

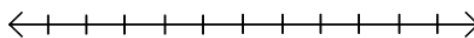
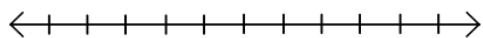
**Step 3:**



**Example 2: Solve the inequalities**

a)  $22 > m - 8$

b)  $3a + 6 \leq 4a$



**Application:** A basketball player's goal was to score at least 150 points this season. So far, she has scored 123 points. If there is one game left, how many points must she score to reach her goal?

*If you multiply or divide each side of an inequality by a \_\_\_\_\_, then the inequality remains \_\_\_\_\_.*

Example:  $4 > 2$   
 $4(3) > 2(3)$  Multiply both sides by 3.  
 $12 > 6$

\* Notice that the direction of the inequality remains the \_\_\_\_\_. The statement is still \_\_\_\_\_.

*If you multiply or divide each side of an inequality by a \_\_\_\_\_, the inequality symbol \_\_\_\_\_ direction.*

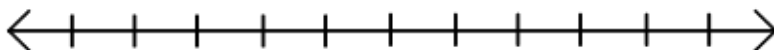
Example:  $7 < 9$   
 $7(-2) > 9(-2)$  Multiply both sides by -2.  
 $-14 > -18$

\* Notice that in order to keep the statement true, we need to \_\_\_\_\_ the inequality symbol.

To solve an inequality with multiplication and division.

4. \_\_\_\_\_ like you would a normal equation.
5. \_\_\_\_\_ to switch the inequality if needed.
6. \_\_\_\_\_ the inequality on a number line.

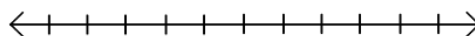
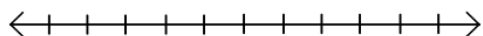
**EXAMPLE 1:** Solve and graph the solution  $\rightarrow 8n < 40$



**Example 2: Solve the inequalities**

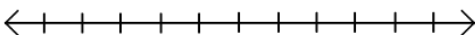
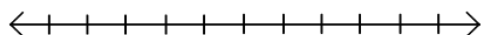
a)  $-42 > 6p$

b)  $-28 \geq -7x$



c)  $-\frac{4}{3}p > -8$

d)  $-\frac{n}{2} \leq 8$



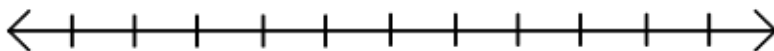
**Application:** Mario purchases a prepaid phone plan for \$50 at \$0.13 per minute. How many minutes can Mario talk on this plan?

### Day 4 Notes – Solving Multi-Step Inequalities

The most important thing to remember when solving multiple step inequalities is that if you divide by a \_\_\_\_\_ you must \_\_\_\_\_ the inequality sign.

Using \_\_\_\_\_ operations you are going to \_\_\_\_\_ for your variable. Don't forget order of operations!

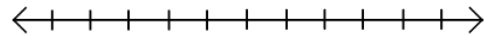
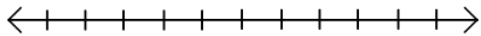
**EXAMPLE 1:** Solve and graph the solution  $\rightarrow 3b + 7 \leq 13$



**Example 2: Solve the inequalities DON'T FORGET TO WATCH YOUR SIGNS**

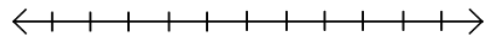
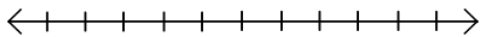
$$a) -11y - 13 > 42$$

$$b) 23 \geq 10 - 2w$$



$$c) 43 > -4y + 11$$

$$d) 13 - 11d \geq 79$$

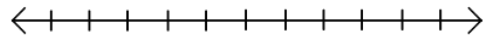
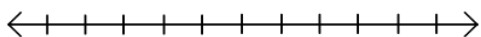


Whenever you see parenthesis that means that you need to \_\_\_\_\_ first and then use inverse operations to get the variable by itself.

When we have variables on \_\_\_\_\_ sides of the equation always move the variable that has the \_\_\_\_\_ coefficient.

$$e) 4(3t - 5) + 7 \geq 8t + 3$$

$$f) 6(5z - 3) \leq 36z$$



### Writing and Solving inequalities

We can translate sentences into multi-step inequalities and then solve them using the properties we have learned so far. Our first step is to \_\_\_\_\_ the variable and then \_\_\_\_\_ up an inequality and finally \_\_\_\_\_ the inequality.

### **Example 3:**

a) five minus six times a number is more than four times the number plus 45

b) two more than half of a number is greater than twenty-seven

**Application:** Write and solve an inequality to find the sales Mrs. Jones needs if she earns a monthly salary of \$2000 plus a 10% commission on her sales. Her goal is to make at least \$4000 per month. What sales does she need to meet her goal?

**Literal Equations**  
In-Class Worksheet

Name: \_\_\_\_\_  
Date: \_\_\_\_\_ Class: \_\_\_\_\_

Solve the following equations and explain your work.

1.  $5a + 2 = 6 - 7c$  for  $c$  | Steps

--	--

2.  $7x + 5y = -5$  for  $y$  | Steps

--	--

3.  $\frac{k-2}{5} = 11j$  for  $k$  | Steps

--	--

4.  $u = vw + z$  for  $w$  | Steps

--	--

The formula for area of a triangle is  $A = \frac{1}{2}bh$ , where  $A$  is the area,  $b$  is the base, and  $h$  is the height.

5. Solve the formula for  $b$

6. If the area is  $16\text{ft}^2$  and the height is  $4\text{ft}$ , what is the length of the base in  $\text{ft}$ ?

The formula for the Slope-intercept form  $y = mx + b$

7. Solve for  $x$ : \_\_\_\_\_

8. Solve for  $m$ : \_\_\_\_\_

9. Solve for  $b$ : \_\_\_\_\_

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Period: \_\_\_\_\_

### Graphing Inequalities In-Class Worksheet

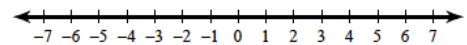
**Matching. You may use a letter more than once.**

- |                                  |                      |
|----------------------------------|----------------------|
| ____ A. more than                | ____ E. no more than |
| ____ B. less than or equal to    | ____ F. at least     |
| ____ C. at most                  | ____ G. less than    |
| ____ D. greater than or equal to | ____ H. no less than |

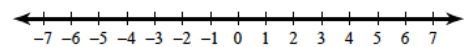
A. $\leq$
B. $>$
C. $\geq$
D. $<$

**Translate the following statements into mathematical statements or inequalities. Draw on a number line.**

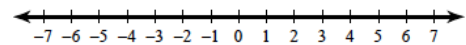
1) Some number is greater than three. \_\_\_\_\_



2) A number is less than or equal to five. \_\_\_\_\_

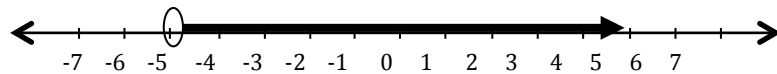


3) A quantity is no more than negative five. \_\_\_\_\_

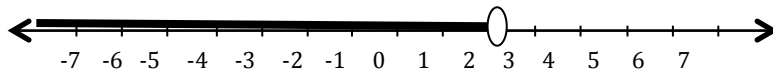


**Write the inequality statement ( Ex.  $x \geq 3$  ) for each graph.**

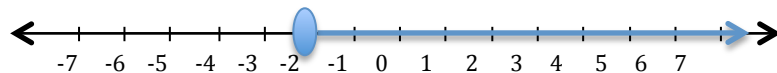
4) \_\_\_\_\_



5) \_\_\_\_\_

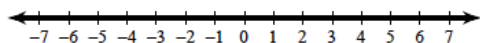


6) \_\_\_\_\_

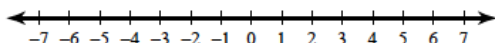


**Draw a graph for each inequality**

7)  $k \leq -2$



8)  $m < -5$



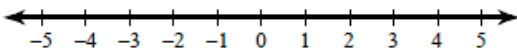
Name: \_\_\_\_\_ Date: \_\_\_\_\_ Period: \_\_\_\_\_

## Solving One-Step Inequalities In-Class Worksheet

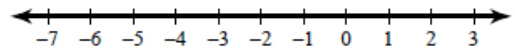
1. When you multiply or divide by a negative number you must \_\_\_\_\_ the inequality.

2. Your brother has \$2,000 saved for a vacation. His airplane ticket is \$637. Write and solve an inequality to find out how much he can spend for everything else.

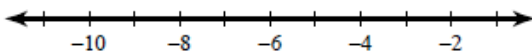
3)  $0 \geq 7n$



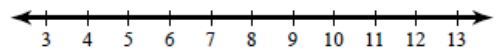
4)  $b - 7 < -12$



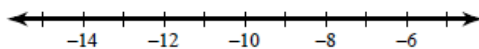
5)  $n - 6 \leq -14$



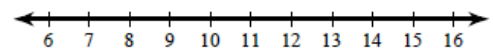
6)  $-9x \geq -90$



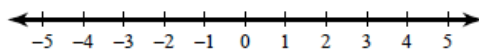
7)  $3 + v \leq -9$



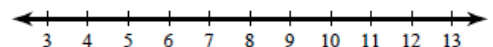
8)  $8 \geq n - 6$



9)  $-3x > 3$



10)  $\frac{n}{3} > 3$



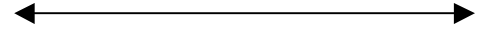


## Solving Multi-step Inequalities In-Class Worksheet

**Translate the following statements into mathematical statements or inequalities. Solve the inequality and then graph it on the number line.**

1) Four times a number plus twelve is less than the number minus three.

\_\_\_\_\_



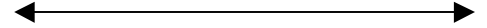
2) Four times a number minus 6 is greater than eight plus two times the number.

\_\_\_\_\_



3) Negative three times a number plus 4 is less than five times the number plus 8.

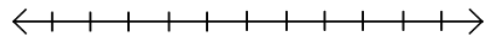
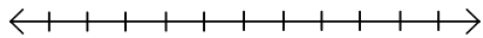
\_\_\_\_\_



**Solve the Inequality and graph the solution:**

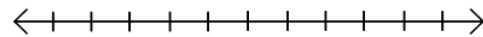
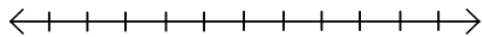
4.  $6h - 10 \geq 32$

5.  $-3 \leq \frac{2}{3}r + 9$



6.  $-3x + 7 > 43$

7.  $4m - 17 < 6m + 25$



8.  $28 - k \geq 7(k - 4)$

9.  $3 < -5n + 2n$

