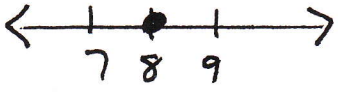
Name _____
Date_____ Class____

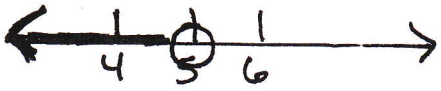
Equations vs Inequalities

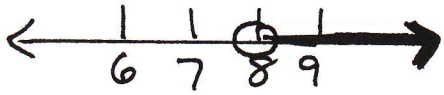
Examples of equation solutions on a number line:

$x = 5$ 

$x = 8$ 

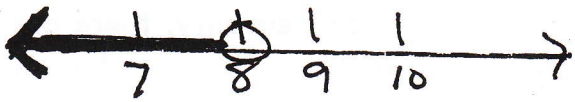
Examples of inequality solutions on a number line:

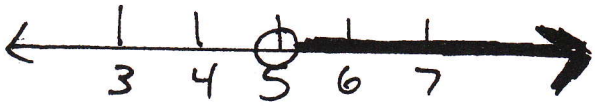
$x < 5$ 

$x > 8$ 

1) What is the difference in the solution for an equation versus the solution for an inequality?

2) If the variable is on the left side of the inequality, do you notice anything about the inequality sign and the direction you shade? (See examples above and these examples to help you.)

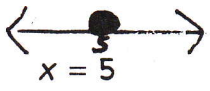
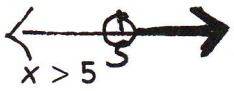
$x < 8$ 

$x > 5$ 

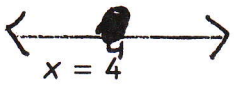
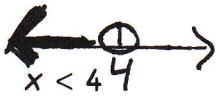
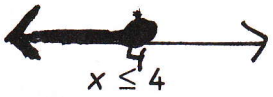
3) If $8 < x$, how would you graph the solution?

Think about how $\leq$ and $\geq$ are graphed.

Graph $x \geq 5$:

If  and  then 

Graph $x \leq 4$:

If  and  then 

Graph the following:

4) $x = 6$ 

5) $x > 6$ 

6) $x \leq 6$ 

7) $x = 9$ 

8) $x > 9$ 

9) $x \geq 9$ 

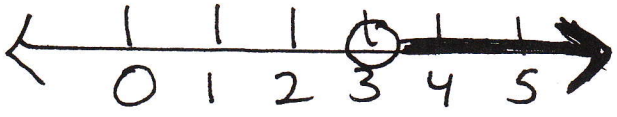
If you are graphing the solution of a multi-step inequality, there are 3 steps you must complete: (1) solve; (2) graph the solution; (3) check the solution.

Example: $3x + 5 > 14$

Step 1 - Solve.

$$3x + 5 > 14$$
$$-5 \quad -5$$
$$3x > 9$$
$$\frac{3}{3} \quad \frac{3}{3}$$
$$x > 3$$

Step 2 - Graph.



Step 3 - Check.

Since x is greater than 3, it does not include 3. So, to check your solution, you must pick a number from the set of numbers to the right of 3 on a number line.

For instance, 4 is in the solution set. Check the problem using 4.

$3(4) + 5 > 14$

$12 + 5 > 14$

$17 > 14$ - True Statement!

Another example:

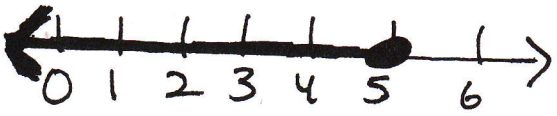
$2x + 8 \leq 18$

$-8 \quad -8$

$\frac{2x \leq 10}{2 \quad 2}$

$x \leq 5$

Graph:



Check: Can you use 0 to check?

YES! $2(0) + 8 \leq 18$

$0 + 8 \leq 18$

$8 \leq 18$ - True Statement!