Notes: U1AL5 Evaluate & solve & graph Inequalities Name: _____ HR: _____

Ur notes and questions

Target Skill(s): 1. Evaluate inequalities by substitution of know value
2. Solve and graph one-step and two-step inequalities
3. interpret inequality symbols and represent solutions on a number line

Inequality Symbols

$>$	$<$	$\leq$	$\geq$
Greater Than	***Less Than***	***Less Than or Equal To***	***Greater Than or Equal To***
$8 > 2$	$2 < 8$	$x \leq 10$	$x \geq 4$
"8 is greater than 2"	"2 is less than 8"	"x is less than or equal to 10"	"x is greater than or equal to 4

Directions: Evaluate the inequality for the given value of the variable and check if the statement is TRUE or FALSE. (show evaluation)

1. $2x + 1 < 9$ when $x = 3$

$2(3)+1$
$7 < 9$
3 is a Solution
$x=3$ make the inequality true

2. $5y - 4 \geq 6$ when $y = 2$

$5(2)-4$
$10-4$
$6 \geq 6$
yes — $y=2$ is a solution
Solution ?

3. $3z + 7 > 10$ when $z = 1$

$3(1)+7$
$10 > 10$ No False
$z=1$ Not a Solution

Solving Inequalities: (Solve just like equations with ONE EXCEPTION.)

1. ***Simplify each side of the inequality by distributive property or like terms (if possible.)***
2. ***Use Add/Sub to get Variables terms on 1 side and Constants on the other.***
3. ***Use Mult/Div to get Variable alone, ...BUT if you....***

If you every MULTIPLY or DIVIDE by a NEGATIVE NUMBER you MUST FLIP the inequality to keep the statement TRUE.

Directions: Solve the inequality.

4. $y - 5 \geq 2$

$+5 \quad +5$
$y \geq 7$

5. $15 \geq -3y$

$-3 \quad -3$ ← Divide by − must FLIP "inequality"
$-5 \leq y$
$y > -5$

6. $\frac{x}{-4} < 3$ · -4

$x > -12$

7. $2x + 3 \leq 9$ $-3 \quad -3$ $\frac{2x}{2} \leq \frac{6}{2}$ $x \leq 3$	8. $-4 > 5 - 3y$ $-5 \quad -5$ $-9 > -3y$ $-3 \quad -3$ ← ÷ − $3 < y$ $y > 3$	9. $-4z - 2 > -14$ $+2 \quad +2$ $-4z > -12$ $-4 \quad -4$ $z < 3$

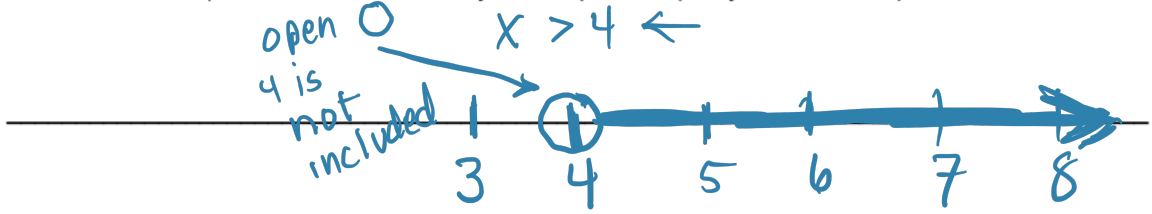
Graphing Inequalities (on a number line):

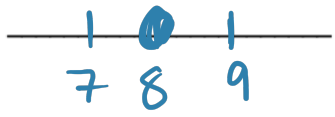
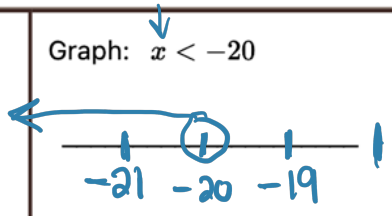
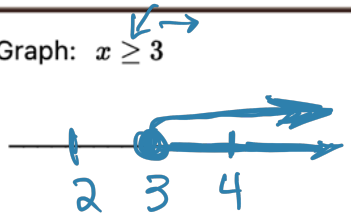
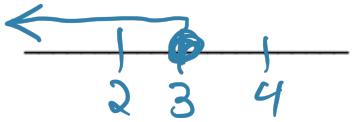
When problems have MANY answers people frequently graph the solutions to look for patterns and understand answers better.

For single inequalities like $x > 4$, you always write them with the VARIABLE on the LEFT. So they read like a sentence that describes x. "x is greater than 4."

When you graph you GRAPH the NUMBERS that MAKE the EQUATION TRUE.

Graph the values of x, that make that "satisfy" the equation. (They make it true.): $x > 4$



Graph: $x = 8$  	Graph: $x < -20$  	Graph: $x \geq 3$ 
10. $2x + 3 \leq 9$ $-3 \quad -3$ $\frac{2x}{2} \leq \frac{6}{2}$ $x \leq 3$  	11. $-3y + 4 > 1$ $-4 \quad -4$ $-3y > -3$ $-3 \quad -3$ ← ÷ − FLIP $y < 1$  	12. $\frac{z}{2} - 5 \geq -1$