# Section 6-4: Multi-Step Inequalities

#### Review:

When graphing an inequality:

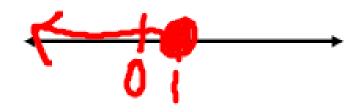
- Find the # on the # line and circle it.
- Open circle if < or >
   Filled in circle if ≤ or ≥
- 3. Is the variable bigger or smaller than the #? Shade that side.

## **Graph the following:**

-5 < w



$$1 \ge z$$



### **Solving Inequalities:**

- 1. Use the distributive property or combine like-terms.
- Get the variable alone by adding or subtracting.
- Multiply or Divide to solve for the variable.
- 4. Check your answer.
- \*Same steps as solving equations\*

\*\*Remember, if you multiply or divide by a negative number, you must flip the inequality sign.\*\*

$$-\frac{2x}{3} < 8 \qquad (-\frac{31}{3}) > 6(-3) \qquad \frac{4w}{4} < -\frac{20}{4}$$

$$-\frac{1}{3} > 4 \qquad 4 < -\frac{18}{4}$$

$$x > -4 \qquad y < -18$$

$$w < -5$$

Ex 1: 
$$3(w + 7) < 12$$
  
 $3w + 21 < 12$   
 $-24 - 21$   
Ex 2:  $-5x + 3 + 2x \ge 30$   
 $-3x + 3 \ge 30$   
 $-3x \ge 22$ 

Ex 3: 
$$12x + 2 > 2x - 82$$
  
 $+82$   $+ 80$   
 $-12x + 84 > 2x$   
 $-12x + 84 > 2x$ 

Ex 4: 
$$4 < z + 1$$
  
 $(-2)^3 < 3(-2)$   
 $(-6)^2 > 2$ 

#### Ex. 5:

