# **<u>6.1:</u>** Solving Inequalities Using Addition and Subtraction Goals:

#### \*Graph inequalities on a number line

- Decide if the circle is open or closed

- Decide which direction the arrow should point

\*Solve one-step inequalities using addition and subtraction

 $x \ge 5$  means that x can be: 5 or more

x < -1 means that x can be <u>anything less than -1</u>.  $x \underline{\text{CANNOT}}$  be <u>-1</u>!

### To Graph a Number on a number line:

- 1. Start at the number on the number line.
- 2. Place a closed (filled in) circle if  $\geq$  or  $\leq$ . This means that the number is included in the solution.

Place an open circle if > or <. This means the number is not included in the solution.

**3.** Draw an arrow pointing to all of the other possibilities (Hint: If the variable is on the left, then the arrow points the same way as the inequality sign)

### Graph the following inequalities on a number line:

**Ex:** Graph *x* < 3.



**Ex:** Graph  $x \ge -1$ 



**Ex:** Graph  $5 \ge x$  (if you read this starting with *x*, it would say that *x* is less than or equal to 5)



## Solving inequalities using addition and subtraction:

- **1.** Solve like a normal equation (use inverse operations)
- 2. Graph the solution on a number line

Ex: 
$$x-5 > -3.5$$
  
 $+5 +5$   
 $x > 1.5$   
 $x > 1.5$ 

## Solve and graph solution on a number line:

<b>Ex:</b> $x - 9 \le 3$	<b>Ex:</b> $p - 9.2 < 5$	<b>Ex:</b> $-1 \ge m - \frac{1}{2}$
<i>x</i> ≤ 12	<i>p</i> < 14.2	$-\frac{1}{2} \ge m$

<b>Ex:</b> $9 \ge x + 7$	<b>Ex:</b> $y + 5.5 > 6$
$2 \ge x$	<i>y</i> > 0.5

**Ex:** You are checking a bag at an airport. Bags can weigh no more than 50 pounds. Your bag weighs 16.8 pounds. Find the possible weights w (in pounds) that you can add to the bag.

$$16.8 + x \le 50$$
$$x \le 33.2$$

33.2 pounds or less