7.5 (pg 326)   Inequalities
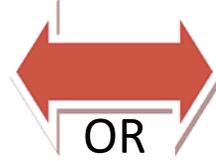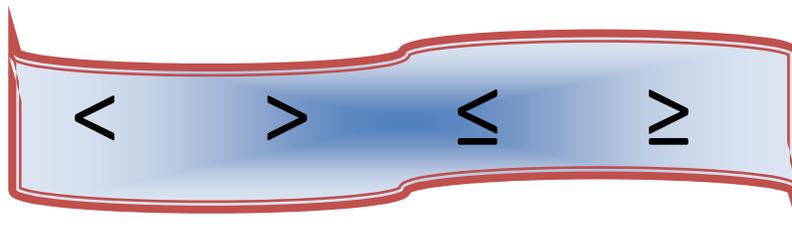
An ==inequality== is a mathematical sentence that compares quantities.

Examples: y + 4 > 6   OR   x + 3 ≥ 10

Inequalities contain the symbols:

$$< \qquad > \qquad \leq \qquad \geq$$

Symbols	<	>	≤	≥
Words	*is less than *is fewer than	*is greater than *is more than	*is less than or equal to *is at most	*is greater than or equal to *is at least
Examples	3<5	8>4	7≤10	12≥9

Example: Is the given value a solution of the inequality?

$x + 3 > 9$, $x = 4$ Write the inequality. $12 \leq 18 - y$, $y = 6$

$4 + 3 \overset{?}{>} 9$ Replace x with 4.   Replace y with 6. $12 \overset{?}{\leq} 18 - 6$

$7 \not> 9$ Simplify. $12 \leq 12$ ✓

Since 7 is not greater than 9, 4 is not a solution.   Since 12 is equal or greater than 12, 6 is a solution.

You can write an inequality to represent a situation:

Ex: You must be at least 12 years old to ride a coaster.

Let a = your age, therefore, $a \geq 12$

Ex: Your brother weighs less than 34 pounds.

Let f = your brother's weight, therefore, $f < 34$

Inequalities can be graphed on a number line. The solution set are all the numbers that can make the inequality

Steps for creating your number line:

Step 1: Draw a straight line (with arrows on the end) with ≥ 5 tick marks.

Step 2: Make the middle tick mark the number you are dealing with and complete the number line.

Step 3: Draw a circle on the center tick mark. Fill it in ONLY IF the solution includes this number (≥ , ≤).

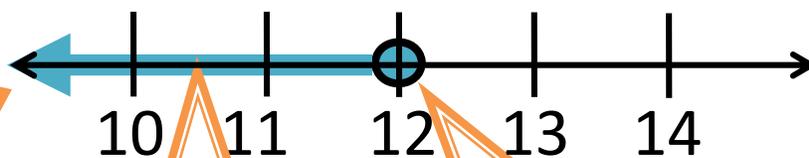**Step 4:** Highlight the line in the correct direction and fill in the arrow.

Example $x > 5$

This arrow would be filled in because the solution goes on forever.

3   4   5   6   7
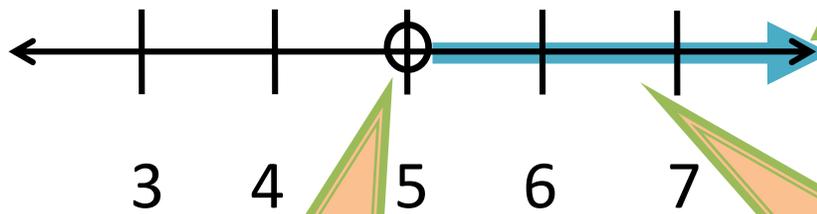
This dot would **NOT** be filled in because 5 is not part of the solution set.

This line would be highlighted because 6 and 7 are part of the solution.

Example: $x \leq 12$

This arrow would be filled in because the solution goes on forever.

10   11   12   13   14

This line would be highlighted because 10 and 11 are part of the solution.

This dot would be filled in because 12 is part of the solution set.

1. Swim practice will be no more than 35 laps.
2. Kevin ran for less than 5 miles.
3. You can't spend more than 50 dollars.
4. More than 800 fans attended the soccer game.

1. n≤35 35≥n
2. k<5   5>k
3. n≤50
4. f>800