A statement involving the word AND is only true if:
BOTH parts are true.

$13 < 4x + 5 < 21$

This compound inequality
is really a combination of
the two following inequalities:

$4x+5>13$ AND $4x+5<21$

A statement involving the word OR is true if:

- Only one of the statmens is true
  or
- If both statements are true

Solve: $2w - 1 > 5$ AND $2 - 3w > -19$

$+1 \quad +1 \qquad -2 \quad -2$

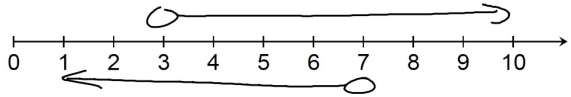
$\frac{2w}{2} > \frac{6}{2} \qquad \frac{-3w}{-3} > \frac{-21}{-3}$

$w > 3$ AND $w < 7$

is there a way to write this answer
as a single statement?

Inequalities connected with the word AND:

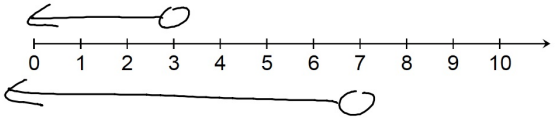
w > 3 AND w < 7



Can be written as one inequality: 3 < w < 7

Inequalities connected with the word AND:

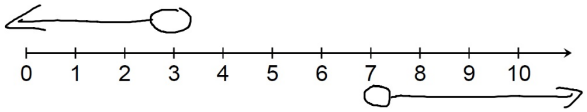
w < 3 AND w < 7



Can be written as one inequality: w < 3

Inequalities connected with the word AND:

w < 3 AND w > 7



Can be written as NO SOLUTION

When you graph two inequalities connected with the word

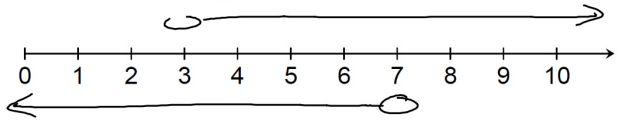
AND

the final solution is:

The interval where the graphs OVERLAP

Inequalities connected with the word OR:

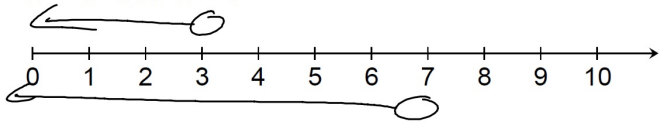
$w > 3$ OR $w < 7$



Can be written as ALL REAL NUMBERS

Inequalities connected with the word OR:

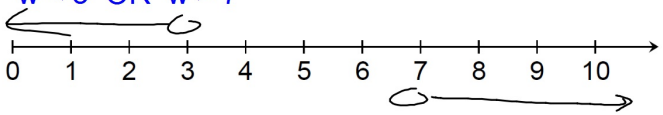
$w < 3$ OR $w < 7$



Can be written as one inequality: $w < 7$

Inequalities connected with the word OR:

$w < 3$ OR $w > 7$



Can be written as only $w < 3$ OR $w > 7$

When you graph two inequalities connected with the word OR the final solution is:

Anywhere the graph is shaded. (for either or both inequalities)

What would have to be true for a compound inequality using the word **AND** to have NO SOLUTION?

- There are no numbers that make both inequalities true.
- Graphs of inequalities don't overlap anywhere.

What would have to be true for a compound inequality using the word **AND** to have a solution of ALL REAL NUMBERS?

- The solution to BOTH inequalities must be All Real Numbers.
- Both graphs must be the entire number line.

What would have to be true for a compound inequality using the word **OR** to have NO SOLUTION?

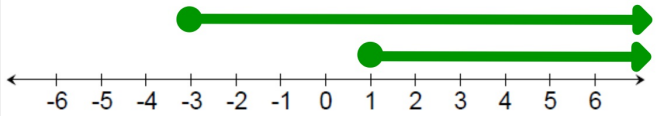
- Both inequalities must be NO SOLUTION.

What would have to be true for a compound inequality using the word **OR** to have a solution of ALL REAL NUMBERS?

- The solutions to the two inequalities combined must contain all real numbers.
- Graphs must point in opposite directions and overlap.

To solve a compound inequality you solve the two inequalities then take these solutions and use the word connecting them to determine the final solution.

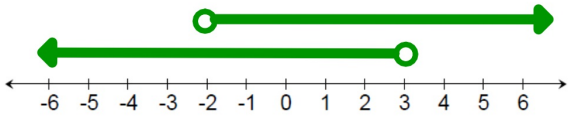
Always write your answer as a single statement, if possible.



What is the solution to the above compound inequality using the word....

AND $x \geq 1$

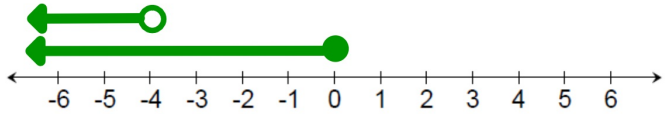
OR $x \geq -3$



What is the solution to the above compound inequality using the word....

AND $-2 < x < 3$

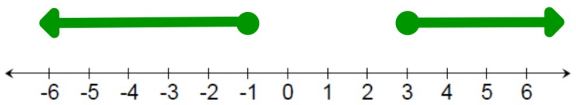
OR $\mathbb{R}$



What is the solution to the above compound inequality using the word....

AND $x < -4$

OR $x \leq 0$



What is the solution to the above compound inequality using the word....

AND

NO SOL

OR

$x \leq -1$ or $x \geq 3$

You can now finish....

Hwk #3: Sec 1-4

Page 29 Due tomorrow

Problems 21-24, 28, 34, 48, 55

Write all answers as a single statement, if possible.