AND OR

AND

For dinner Eric said that he will eat a salad AND a hamburger.

- Eric ate only a salad. Is his original statement true or false? False
- Eric ate only a hamburger. Is his original statement true or false? False
- Eric ate both a salad and a hamburger. Is his original statement true or false? True

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

OR

Amani said that tonight she would study OR listen to music.

- Amani only studied. Is her statement true or false? True
- Amani only listened to music. Is her statement true or false? True
- Amani studied and listened to music. Is her statement true or false? True

A statement involving the word OR is true if:
- Only one of the statmens is true
  or
- If both statements are true

$13 < 4x + 5 < 21$

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

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

Solve. $13 < 4x + 5 < 21$

$-5 \quad -5 \quad -5$

$8 < 4x < 16$

$2 < x < 4$

or

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

$-5 \quad -5 \qquad -5 \quad -5$

$\frac{4x}{4} > \frac{8}{4} \qquad \frac{4x}{4} < \frac{16}{4}$

$x > 2$ AND $x < 4$

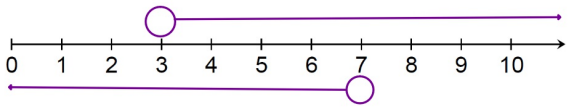
Compound Inequalities

Two inequalities connected with one of the following words:

AND OR

Inequalities connected with the word AND:

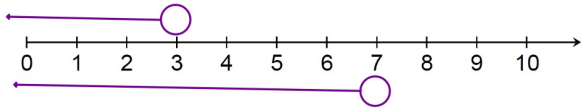
$w > 3$ AND $w < 7$



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

Inequalities connected with the word AND:

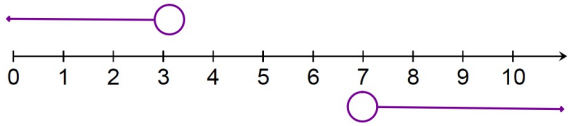
$w < 3$ AND $w < 7$



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

Inequalities connected with the word AND:

$w < 3$ AND $w > 7$



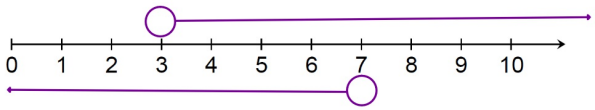
Can be written as NO SOLUTION

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

Where they OVERLAP

Inequalities connected with the word OR:

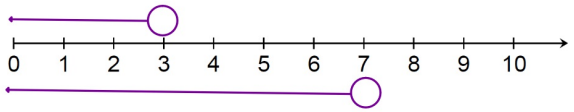
w > 3 OR w < 7



Can be written as ALL REAL NUMBERS

Inequalities connected with the word OR:

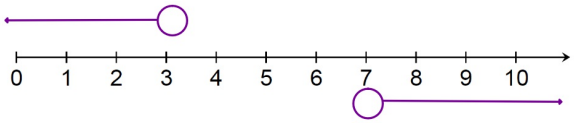
w < 3 OR w < 7



Can be written as one inequality: w < 7

Inequalities connected with the word OR:

w < 3 OR w > 7



Can only be written as 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?

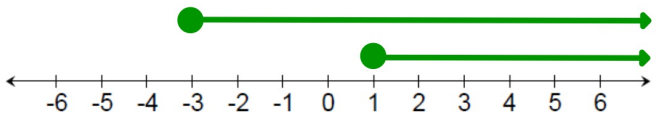
- The solution to BOTH inequalities must be All Real Numbers.
- Both graphs must be the entire number line.

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?

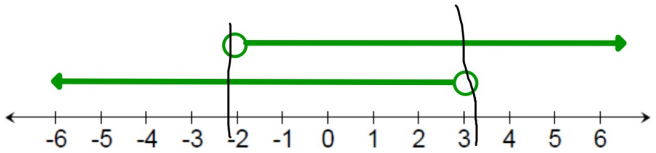
- The solutions to the two inequalities combined must contain all real numbers.
- Graphs must point in opposite directions and overlap.



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

$\mathbb{R}$