Section 1-4:

COMPOUND INEQUALITIES

AND

Eric said that he was going to buy a hat AND a shirt.

Eric bought only a hat. Is his original statement true or false? False

Eric bought only a shirt. Is his original statement true or false? False

Eric bought both a hat and a shirt. 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

Compound Inequalities

Two inequalities connected with one of the following words:

AND OR

$13 < 4x + 5 < 21$

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

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

Whenever an inequality is written this way it ALWAYS implies the use of the word AND!

Solve.

$13 < 4x + 5 < 21$

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

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

$2 < x < 4$

This means that all values BETWEEN 2 and 4 are solutions to the original inequality.

Solve.

$4x - 3 > 7$ or $8 - 2x < 20$

$+3 \quad +3$

$4x > 10$

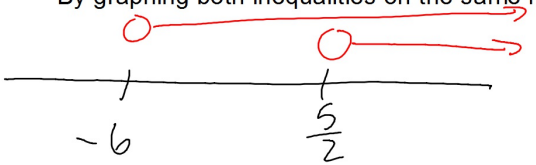
$x > \frac{5}{2}$

or

$-2x < 12$

$x > -6$

By graphing both inequalities on the same number line



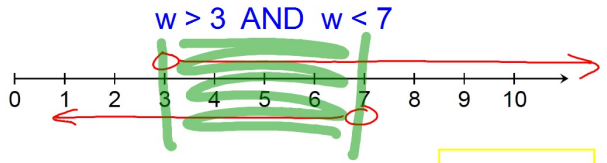
We find the final answer is:

$x > -6$

These are all the values of x that make one or both inequalities true.

Inequalities connected with the word AND:

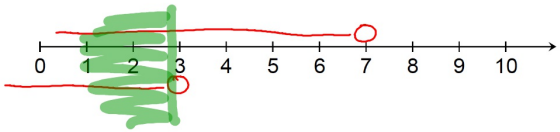
$w > 3$ AND $w < 7$



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

Inequalities connected with the word AND:

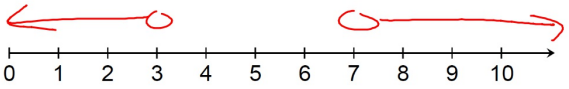
$w < 3$ AND $w < 7$



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 they OVERLAP