Objectives

The student will be able to:

1. solve compound inequalities.
2. graph the solution sets of compound inequalities.

Designed by Skip Tyler, Varina High School

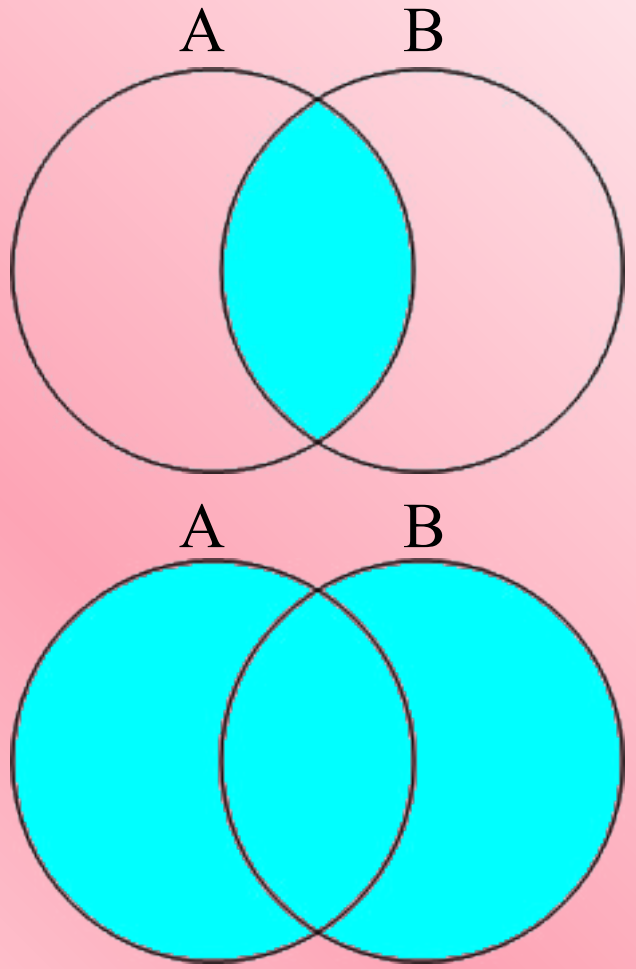
What is the difference between and and or?

AND means intersection

-what do the two items have in common?

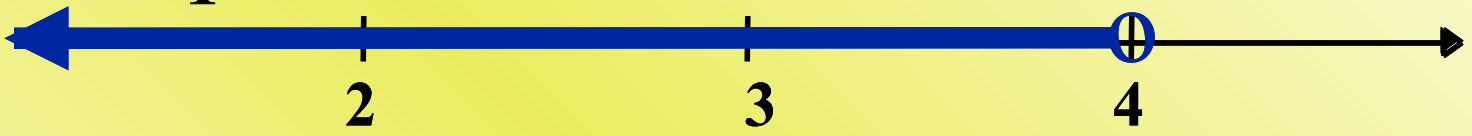
OR means union

-if it is in one item, it is in the solution



1) Graph $x < 4$ and $x \geq 2$

a) Graph $x < 4$



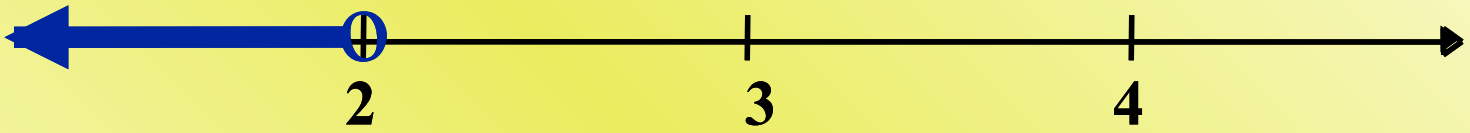
b) Graph $x \geq 2$

c) Combine the graphs

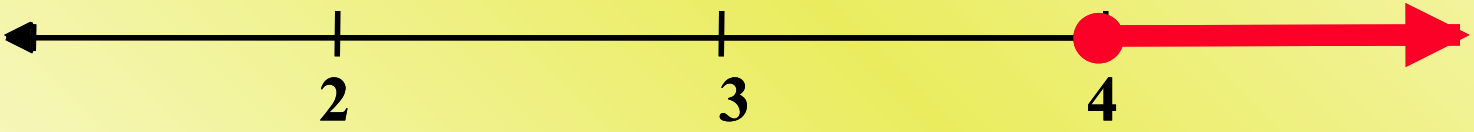
d) Where do they intersect?

2) Graph $x < 2$ or $x \geq 4$

a) Graph $x < 2$

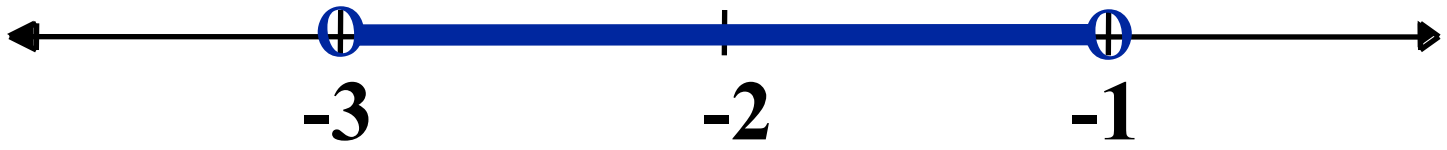


b) Graph $x \geq 4$



c) Combine the graphs

3) Which inequalities describe the following graph?



1. $y > -3$ or $y < -1$
2. ✓ $y > -3$ and $y < -1$
3. $y \leq -3$ or $y \geq -1$
4. $y \geq -3$ and $y \leq -1$

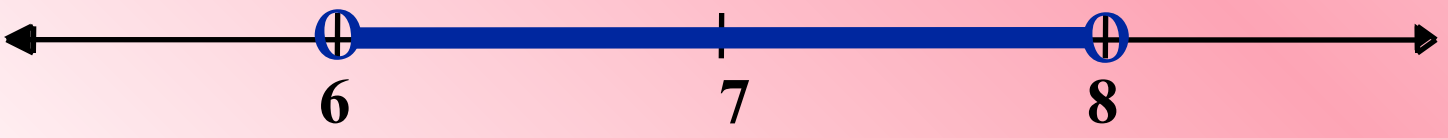
Answer Now

4) Graph the compound inequality $6 < m < 8$

When written this way, it is the same thing as

$6 <$ **m** **AND** **m** < 8

It can be rewritten as $m > 6$ and $m < 8$ and graphed as previously shown, however, it is easier to graph everything between 6 and 8!



5) Which is equivalent to $-3 < y < 5$?

1. $y > -3$ or $y < 5$
2. $y > -3$ and $y < 5$
3. $y < -3$ or $y > 5$
4. $y < -3$ and $y > 5$

Answer Now

6) Which is equivalent to $x > -5$ and $x \leq 1$?

✔1. $-5 < x \leq 1$

2. $-5 > x \geq 1$

3. $-5 > x \leq 1$

4. $-5 < x \geq 1$

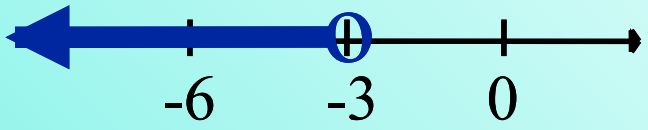
Answer Now

7) $2x < -6$ and $3x \geq 12$

1. Solve each inequality for x
2. Graph each inequality
3. Combine the graphs
4. Where do they intersect?
5. They do not! x cannot be greater than or equal to 4 and less than -3
   No Solution!!

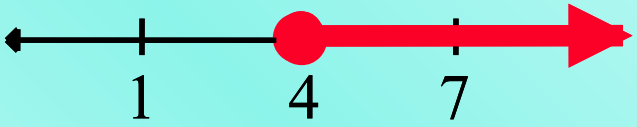
$$\frac{2x}{2} < \frac{-6}{2}$$

$$x < -3$$



$$\frac{3x}{3} \geq \frac{12}{3}$$

$$x \geq 4$$



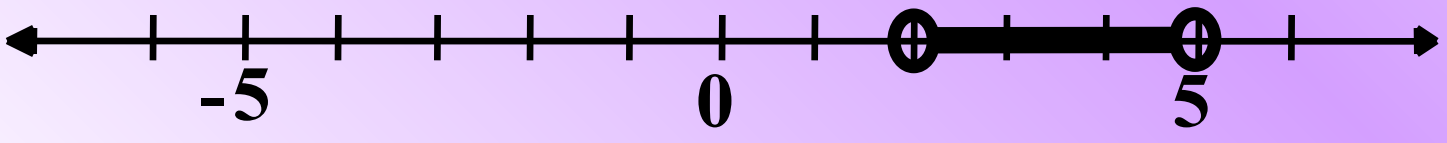
8) Graph $3 < 2m - 1 < 9$

Remember, when written like this, it is an AND problem!

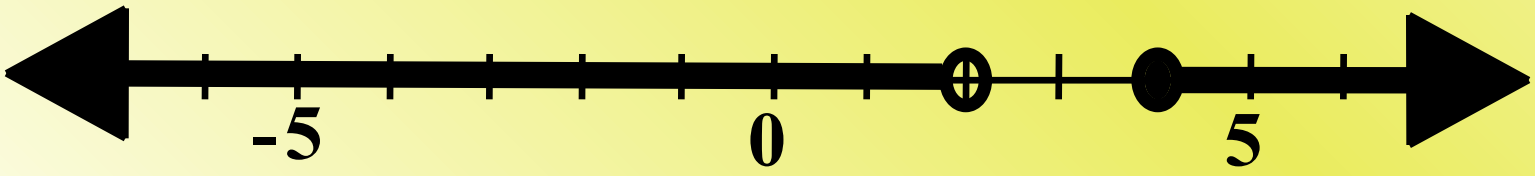
$3 < 2m - 1$ AND $2m - 1 < 9$

Solve each inequality.

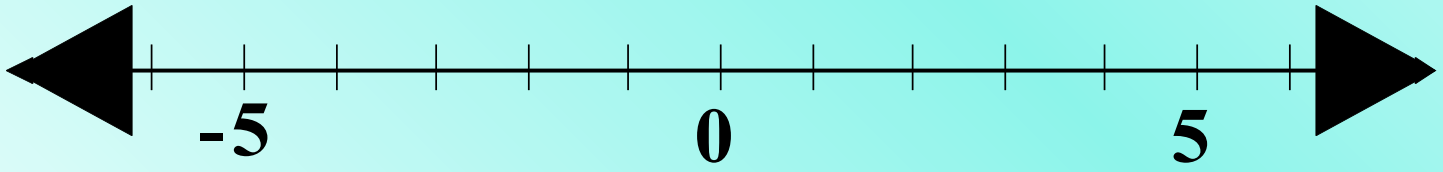
Graph the intersection of $2 < m$ and $m < 5$.



9) Graph $x < 2$ or $x \geq 4$



10) Graph $x \geq -1$ or $x \leq 3$



The whole line is shaded!!