

November 19th

Due Next Class: Video 4.2 + HW 4.2

Unit 4: Inequalities

Lesson 4.2: Compound Inequalities

Get Ready:

Solve & graph each inequality.

Quiz Next Class

1. $3x - 15 < 45$

$$\begin{array}{r} +15 \quad +15 \\ 3x < 60 \\ \hline 3 \quad 3 \\ x < 20 \end{array}$$

2. $3(-m + 2) \leq 6(-2m - 5)$

$$\begin{array}{r} -3m + 6 \leq -12m - 30 \\ +30 \quad +30 \end{array}$$

$$\begin{array}{r} -3m + 36 \leq -12m \\ +3m \quad +3m \end{array}$$

$$\frac{36}{-9} \leq \frac{-9m}{-9}$$

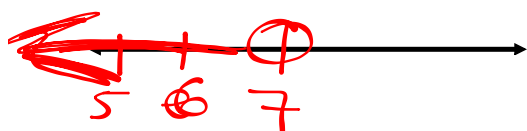
$$-4 \geq m$$

$$m \leq -4$$



Graphing Inequalities:

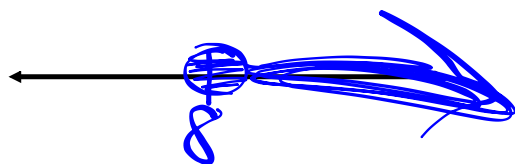
$$g < 7$$



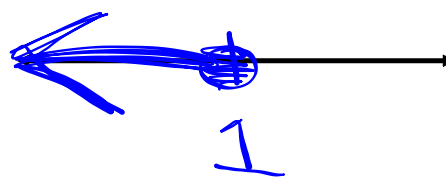
$$p > -19$$



$$w \geq 8$$



$$m \leq 1$$



Sam cuts a 10 m rope into two.

How long is the longer piece?

How long is the shorter piece?



Shorter Piece

↳ Less than 5m

$$r < 5$$

↳ Greater than 0m

$$r > 0$$

Longer Piece

↳ Less than 10m

↳ Greater than 5m.

$l = \text{length of longer}$

$$l < 10$$

$$l > 5$$

Compound Inequalities

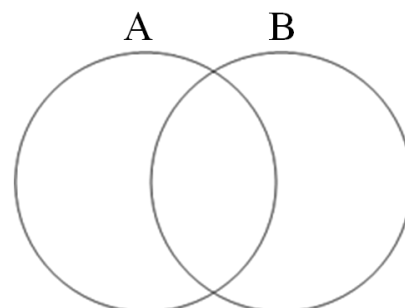
An inequality made up of **TWO** regular inequalities

Conjunctions

What is the difference between
and and or?

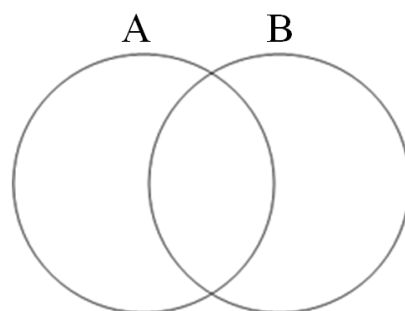
AND means intersection

-what do the two items
have in common?



OR means union

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

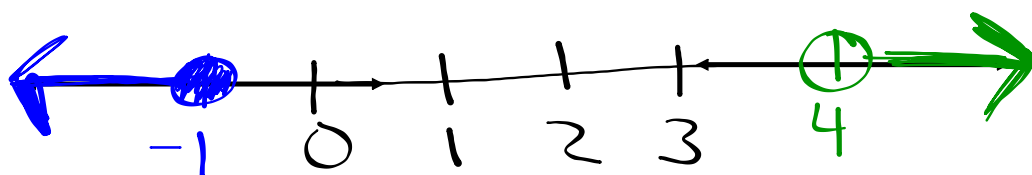


OR

$$x > 4 \text{ OR } x \leq -1$$

Graph $x \leq -1$

Graph $x > 4$



COMBINE THEM TO MAKE ONE SUPER INEQUALITY!

OR inequalities have 2 dots then shade OUT
AND inequalities have 2 dots then shade IN

AND/OR Trick



OR Compound Inequalities

Graph $2m - 2 < 4$ OR $2m + 1 \geq 11$

1. Solve each inequality for the variable.

$$2m - 2 < 4$$

$$\begin{array}{r} +2 \quad +2 \\ \hline \end{array}$$

$$\frac{2m}{2} < \frac{6}{2}$$

$$m < 3$$

$$2m + 1 \geq 11$$

$$\begin{array}{r} -1 \quad -1 \\ \hline \end{array}$$

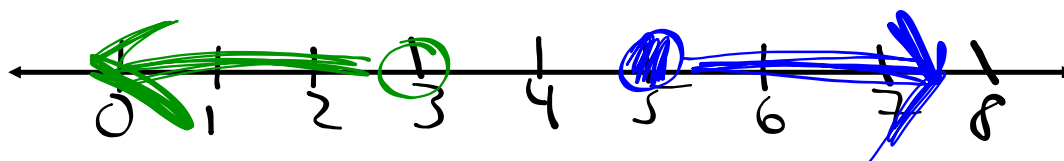
$$\frac{2m}{2} \geq \frac{10}{2}$$

$$m \geq 5$$

OR

2. Graph the two points on a number line.

OR



3. shade OUT for OR and IN for And.

AND Compound Inequalities

Graph $3p + 2 > 11$ AND $5p - 3 \leq 22$

1. Solve each inequality for the variable.

$$3p + 2 > 11$$

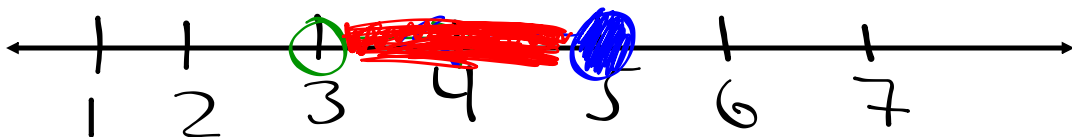
$$\begin{array}{r} \underline{-2} \quad \underline{-2} \\ 3p > 9 \\ \underline{\quad} \quad \underline{\quad} \\ 3 \quad \quad 3 \\ p > 3 \end{array}$$

$$5p - 3 \leq 22$$

$$\begin{array}{r} \underline{+3} \quad \underline{+3} \\ 5p \leq 25 \\ \underline{\quad} \quad \underline{\quad} \\ 5 \quad \quad 5 \\ p \leq 5 \end{array}$$

AND

2. Graph the two points on a number line.



3. shade OUT for OR and IN for And.

$$-1 < w \leq 3$$

← And inequality

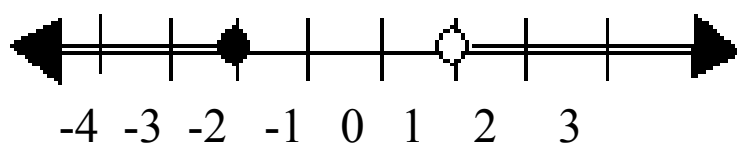
$$-1 < w \text{ And } w \leq 3$$



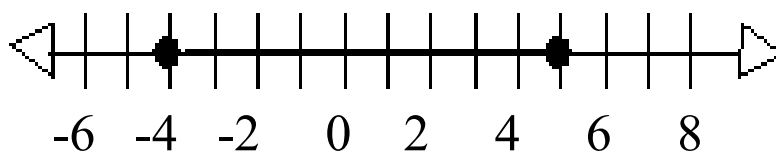
$$0 \geq -3m + 6 > -15$$

$$\begin{array}{l}
 0 \geq -3m + 6 \text{ And } -3m + 6 > -15 \\
 \underline{-6} \quad \underline{-6} \\
 -6 \geq -3m \\
 \underline{-3} \quad \underline{-3} \\
 2 \leq m
 \end{array}
 \quad \text{And} \quad
 \begin{array}{l}
 -3m + 6 > -15 \\
 \underline{-6} \quad \underline{-6} \\
 -3m > -21 \\
 \underline{-3} \quad \underline{-3} \\
 m < 7
 \end{array}$$



Writing the Compound Inequality

$$a \leq -2 \quad \text{OR} \quad a > 1$$



$$b \geq -4 \quad \text{AND} \quad b \leq 5$$