

November 20th

Due Next Class: Video 4.2 + HW 4.2

Unit 4: Inequalities

Lesson 4.2: Compound Inequalities

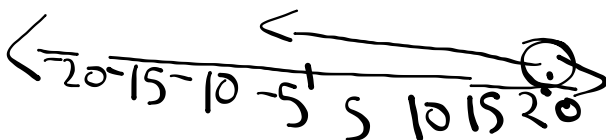
Get Ready:

Quiz Next Class

Solve &amp; graph each inequality.

$$1. \begin{aligned} 3x - 15 &< 45 \\ +15 &< 45 \end{aligned}$$

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

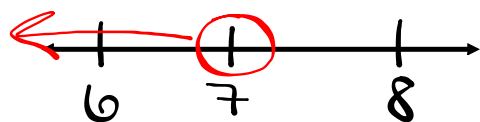


$$2. \begin{aligned} 3(-m + 2) &\leq 6(-2m - 5) \\ -3m + 6 &\leq -12m - 30 \\ -3m - 6 &\leq -12m - 30 \\ +12m &+12m \\ \hline 9m - 6 &\leq -30 \\ 9m &\leq -24 \\ \hline m &\leq -4 \end{aligned}$$

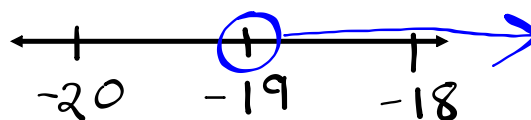


Graphing Inequalities:

$$g < 7$$



$$p > -19$$



$$w \geq 8$$



$$m \leq 1$$



Sam cuts a 10 m rope into two.

How long is the longer piece?

How long is the shorter piece?

Longer

$$L > 5$$

$$L < 10$$

Shorter

$$S < 5$$

$$S > 0$$



## Compound Inequalities

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

We will use  
Conjunctions  
to bring them  
together

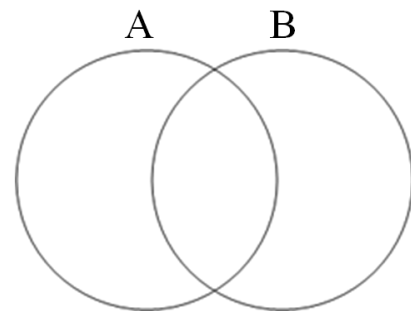
→ **And** → What is  
shared between  
the inequalities?

→ **Or** → What is  
Not shared between  
the inequalities?

What is the difference between  
and and or?

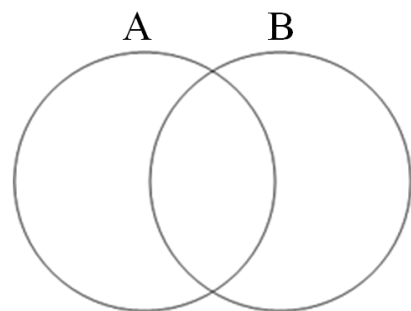
**AND** means intersection

-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  $x \leq -1$

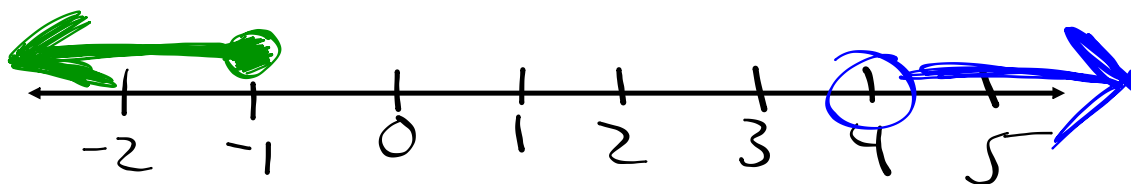


Graph  $x > 4$



COMBINE THEM TO MAKE ONE SUPER INEQUALITY!

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

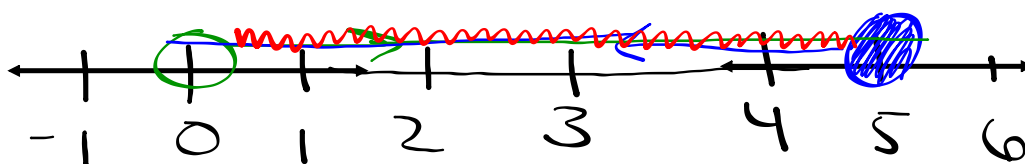


# AND

$$z \leq 5 \text{ AND } z > 0$$

Graph  $z > 0$

Graph  $z \leq 5$



COMBINE THEM TO MAKE ONE SUPER INEQUALITY!

$$z \leq 5 \text{ AND } z > 0$$



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

### AND/OR Trick



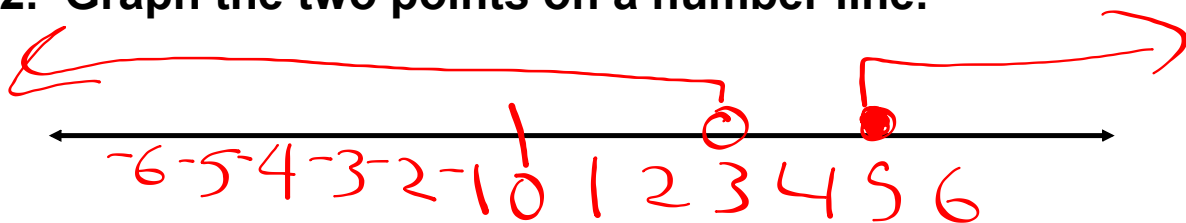
## OR Compound Inequalities

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

1. Solve each inequality for the variable.

$$\begin{array}{ccc}
 2m - 2 < 4 & \text{Or} & 2m + 1 \geq 11 \\
 \begin{array}{r} +2 \quad +2 \\ \hline 2m < 6 \\ \hline m < 3 \end{array} & & \begin{array}{r} -1 \quad -1 \\ \hline 2m \geq 10 \\ \hline m \geq 5 \end{array} \\
 \boxed{m < 3} & \text{ILY;} & \boxed{m \geq 5}
 \end{array}$$

2. Graph the two points on a number line.



3. shade OUT for OR and IN for And.



## AND Compound Inequalities

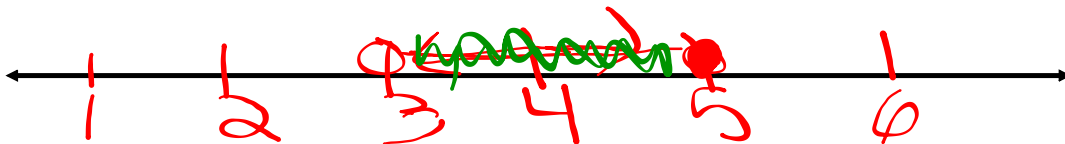
Graph  $3p + 2 > 11$  AND  $5p - 3 \leq 22$

1. Solve each inequality for the variable.

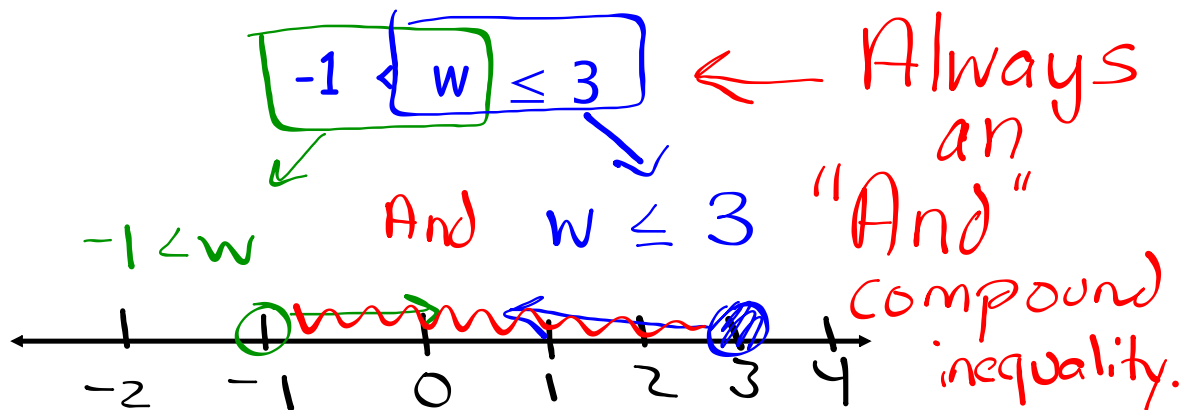
$$\begin{array}{r} 3p + 2 > 11 \\ -2 \quad -2 \\ \hline 3p > 9 \\ p > 3 \end{array}$$

$$\begin{array}{r} 5p - 3 \leq 22 \\ +3 \quad +3 \\ \hline 5p \leq 25 \\ p \leq 5 \end{array}$$

2. Graph the two points on a number line.



3. shade OUT for OR and IN for And.



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

And

$$\begin{array}{r} 0 \geq -3m + 6 \\ \underline{-6} \quad \underline{-6} \\ -6 \geq -3m \\ \underline{-3} \quad \underline{-3} \\ 2 \leq m \end{array}$$

$$\begin{array}{r} -3m + 6 > -15 \\ \underline{-6} \quad \underline{-6} \\ -3m > -21 \\ \underline{-3} \quad \underline{-3} \\ m < 7 \end{array}$$

And

$2 \leq m$       And       $m < 7$

