

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.

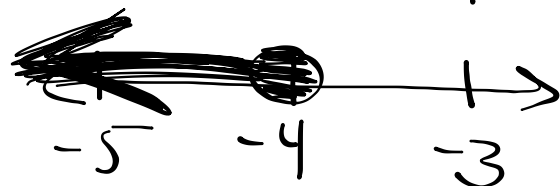
$$1. \quad 3x - 15 < 45$$

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



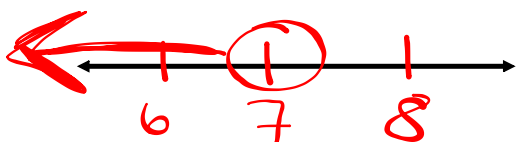
$$2. \quad 3(-m + 2) \leq 6(-2m - 5)$$

$$\begin{array}{r} -3m + 6 \leq -12m - 30 \\ +12m \quad +12m \\ 9m + 6 \leq -30 \\ -6 \quad -6 \\ 9m \leq -36 \\ \hline m \leq -4 \end{array}$$

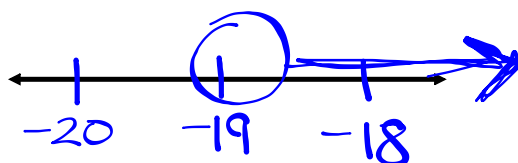


Graphing Inequalities:

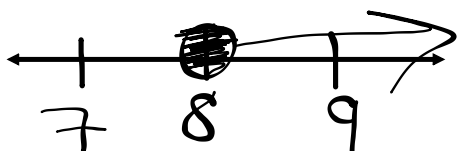
$$g < 7$$



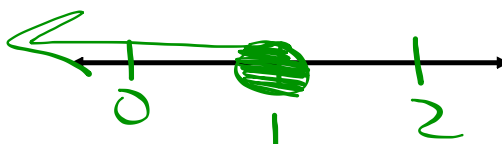
$$p > -19$$



$$w \geq 8$$



$$m \leq 1$$



Sam cuts a 10 m rope into two.

How long is the longer piece?

How long is the shorter piece?

Longer

$$L < 10$$

$$L > 5 \text{ or } 5 < L$$

Shorter

$$S < 5$$

$$S > 0$$



## Compound Inequalities

An inequality made up of TWO regular inequalities

Connected by a conjunction

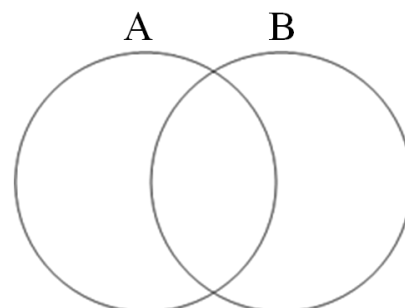
→ AND "Shared" (intersect)

→ OR "not shared"

What is the difference between and and or?

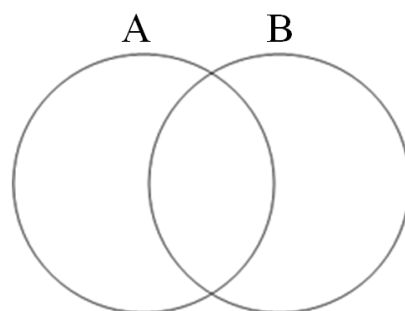
AND means intersection

-what do the two items have in common?



OR means union

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



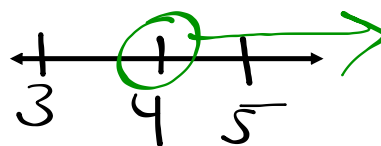
# OR

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

Graph  $x \leq -1$

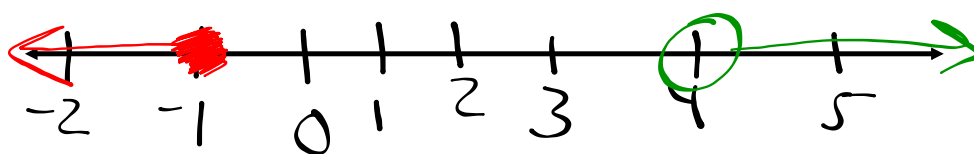


Graph  $x > 4$



COMBINE THEM TO MAKE ONE SUPER INEQUALITY!

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



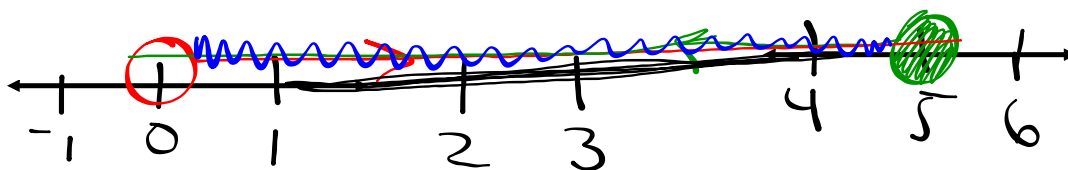
# AND

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

"Share"  
"intersect"

Graph  $z > 0$

Graph  $z \leq 5$



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



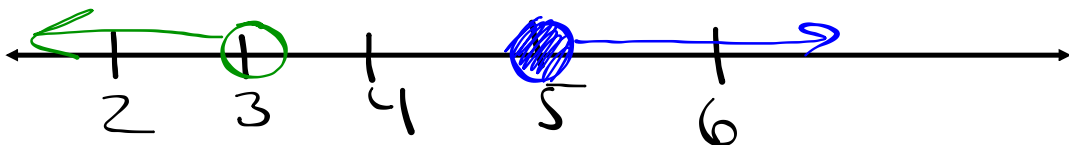
## OR Compound Inequalities

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

1. Solve each inequality for the variable.

$$\begin{array}{ccc}
 2m - 2 < 4 & \text{OR} & 2m + 1 \geq 11 \\
 \underline{+2} \quad \underline{+2} & & \underline{-1} \quad \underline{-1} \\
 \frac{2m}{2} < \frac{6}{2} & & \frac{2m}{2} \geq \frac{10}{2} \\
 m < 3 & \text{OR} & m \geq 5
 \end{array}$$

2. Graph the two points on a number line.



3. shade OUT for OR and IN for And.



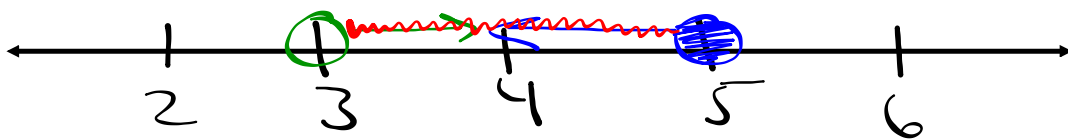
## AND Compound Inequalities

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

1. Solve each inequality for the variable.

$$\begin{array}{rcl}
 3p + 2 > 11 & \text{And} & 5p - 3 \leq 22 \\
 \underline{-2} \quad \underline{-2} & & \underline{+3} \quad \underline{+3} \\
 3p > 9 & & 5p \leq 25 \\
 \frac{3p}{3} > \frac{9}{3} & & \frac{5p}{5} \leq \frac{25}{5} \\
 p > 3 & \text{And} & p \leq 5
 \end{array}$$

2. Graph the two points on a number line.



3. shade OUT for OR and IN for And.

$$-1 < w \leq 3$$

Always "And" Compound Inequality

$-1 < w$  And  $w \leq 3$

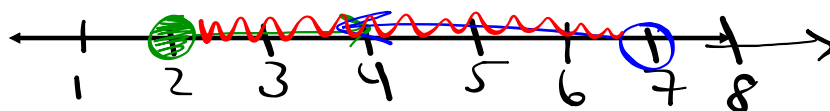


$$0 \geq -3m + 6 > -15$$

$$\begin{aligned} 0 &\geq -3m + 6 \\ -6 &\quad -6 \\ \hline -6 &\geq -3m \\ \frac{-6}{-3} &\quad \frac{-3m}{-3} \\ 2 &\leq m \end{aligned}$$

AND

$$\begin{aligned} -3m + 6 &> -15 \\ \frac{-6}{-6} &\quad \frac{-6}{-6} \\ \hline -3m &> -21 \\ \frac{-3m}{-3} &\quad \frac{-21}{-3} \\ m &< 7 \end{aligned}$$



$$15 > -2m + 1 \geq -9$$

$$\begin{aligned} 15 &> -2m + 1 \\ \frac{-1}{-1} &\quad \frac{-1}{-1} \\ \hline 14 &> -2m \\ \frac{14}{-2} &\quad \frac{-2m}{-2} \\ -7 &< m \end{aligned}$$

And

$$\begin{aligned} -2m + 1 &\geq -9 \\ \frac{-1}{-1} &\quad \frac{-1}{-1} \\ \hline -2m &\geq -10 \\ \frac{-2m}{-2} &\quad \frac{-10}{-2} \\ m &\leq 5 \end{aligned}$$

