



IM 3

2-2 Compound Inequalities Notes

Name: _____ Per: _____ Date: _____

You can join two inequalities with the word *and* or the word *or* to form a **compound inequality**. To solve a compound inequality containing *and*, find all values of the variable that make both inequalities true.

AND - Both Inequalities are True

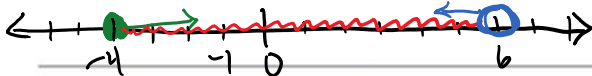
A Practice Solve each compound inequality. Graph the solution.

9. $\frac{6x}{6} \geq \frac{-24}{6}$ and $\frac{9x}{9} < \frac{54}{9}$

$x \geq -4$ and $x < 6$

Closed Graph \rightarrow

AND - Graph between the endpoints
Open Graph \leftarrow



10. $7x > -35$ and $5x \leq 30$

You can collapse a compound *and* inequality, like $5 < x + 1$ and $x + 1 < 13$, into a simpler form, $5 < x + 1 < 13$. You read $5 < x + 1 < 13$ as "x + 1 is greater than 5 and less than 13."

To solve a compound inequality containing *or*, find all values of the variable that make at least one of the inequalities true.

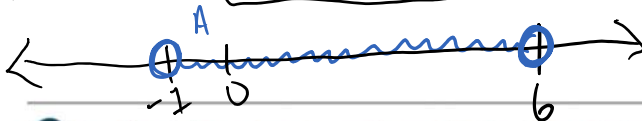
A. Solve and graph $-1 < 3x + 2 < 20$

$3x + 2 > -1$

AND

$3x + 2 < 20$

$$\begin{array}{r} -2 < 3x < 18 \\ \frac{-2}{3} < x < \frac{18}{3} \\ -\frac{2}{3} < x < 6 \end{array}$$



B. Solve and graph $4 \leq 5x + 14 < 24$

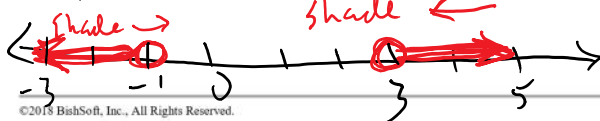
A Practice Solve each compound inequality. Graph the solution.

11. $16 < 5x + 1$ or $3x + 9 < 6$

$\frac{-1}{5} \frac{-1}{5} \quad \frac{-9}{3} \frac{-9}{3}$
 $15 < 5x \quad 3x < -3$

$3 < x \quad x < -1$

$x > 3$ OR $x < -1$



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12. $9x \leq -27$ or $4x \geq 36$

OR - Either inequality is true
Shade opposite direction
 $\leftarrow \circ \quad \bullet \rightarrow$

AND $\bullet \text{---} \circ$ shade between endpoints
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