

WARMUP

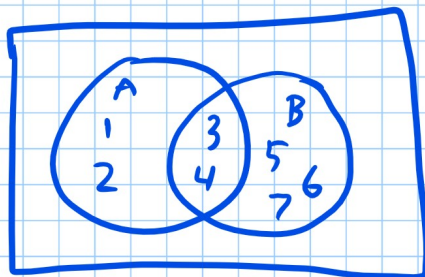
$$A = \{1, 2, 3, 4\} \quad B = \{3, 4, 5, 6, 7\}$$

1) Name the numbers common to both sets

3, 4

2) Name the numbers that are in set A or set B or in both sets A and B

1, 2, 3, 4, 5, 6, 7

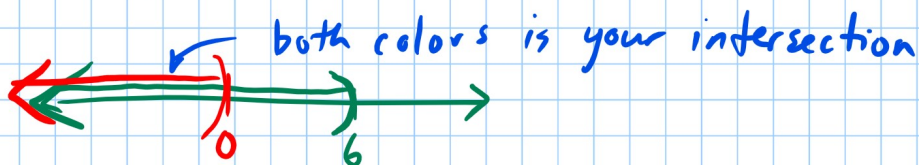


Section 9.2 Compound Inequalities

Intersection: $A \cap B$ means numbers common to both sets
↑
"and"

$$\text{ex: } \{7, 8, 9, 10, 11\} \cap \{6, 8, 10, 12\} \\ = \{8, 10\}$$

$$\text{ex: } x < 6 \text{ and } x < 0$$

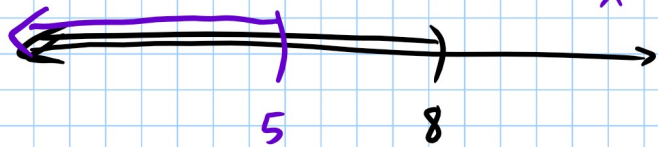


$$-\infty \longleftarrow \text{blue arrow} \text{ pointing left from } 0 \text{ } x < 0 \text{ } (-\infty, 0)$$

For $<$ or $>$
use parentheses

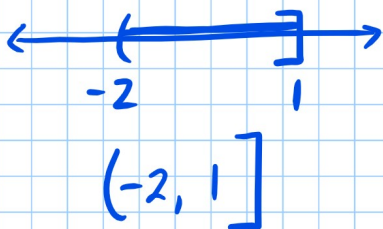
For \leq or \geq
use brackets

$$\text{ex: } \begin{array}{r} x-3 < 5 \\ +3 \quad +3 \\ \hline x < 8 \end{array} \quad \text{and} \quad \begin{array}{r} 2x+4 < 14 \\ -4 \quad -4 \\ \hline 2x < 10 \\ \frac{2x}{2} < \frac{10}{2} \\ x < 5 \end{array}$$



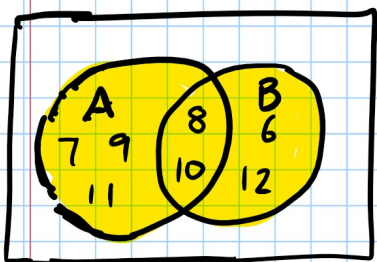
intersection is $x < 5$
 $(-\infty, 5)$

$$\text{ex: } \begin{array}{r} -3 < 2x+1 \leq 3 \\ -1 \quad -1 \quad -1 \\ \hline -4 < 2x \leq 2 \\ \frac{-4}{2} < \frac{2x}{2} \leq \frac{2}{2} \\ -2 < x \leq 1 \end{array}$$



$(-2, 1]$

Union: $A \cup B$ means numbers in A or B or "or" in both.



$$\text{ex: } \{7, 8, 9, 10, 11\} \cup \{6, 8, 10, 12\} \\ = \{7, 8, 9, 10, 11, 6, 12\}$$

$$\underline{\text{ex:}} \quad 2x - 3 > 7 \quad \text{or} \quad 35 - 4x \leq 3$$

$$\begin{array}{r} 2x - 3 > 7 \\ +3 \quad +3 \\ \hline 2x > 10 \\ \frac{2x}{2} > \frac{10}{2} \end{array}$$

$$x > 5$$

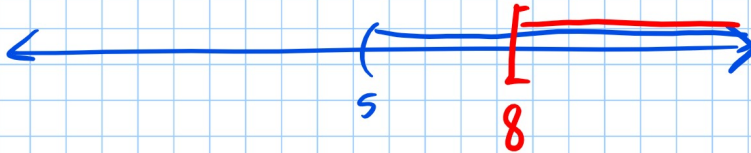
$$\begin{array}{r} 35 - 4x \leq 3 \\ -35 \quad -35 \\ \hline -4x \leq -32 \end{array}$$

$$\begin{array}{r} -4x \leq -32 \\ \frac{-4x}{-4} \leq \frac{-32}{-4} \end{array}$$

$$x \geq 8$$

OR

direction of inequality flips when multiplying or dividing by negative.



$$x > 5$$

$$(5, \infty)$$

For OR the answer is whatever is shaded

For AND the answer is what is double-shaded.

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