

1.7 Solving Inequalities

Obj: 1. Write, solve & graph a linear ineq. in 1 variable

2. Solve & graph a compound ineq.

$$y = x$$

$$10w = 10$$

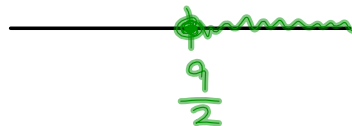
1 solution

Solution set
 $x > 2$
 \geq
 $<$
 \leq

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Solve & graph: $4x - 5 \geq 13$

$$\begin{aligned} 4x - 5 &\geq 13 \\ +5 &+5 \\ \hline 4x &\geq 18 \\ \frac{4x}{4} &\geq \frac{18}{4} \\ x &\geq \frac{9}{2} \end{aligned}$$



$$6x + 1 < 13$$

$$\begin{aligned} 6x + 1 &< 13 \\ -1 &-1 \\ \hline 6x &< 12 \\ \frac{6x}{6} &< \frac{12}{6} \\ x &< 2 \end{aligned}$$



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Solve & graph:

$$4 - 3p > 16 - p$$

~~-4~~ +p
~~-4~~ +p

$$\frac{-2p}{-2} > \frac{12}{-2}$$

$$p < -6$$

* any time you multiply or divide by a negative, you flip the inequality



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$$-5 - 7t > 8 - 4t$$

~~-5~~
~~-5~~

$$-7t > 3 - 4t$$

+t
+4t

$$-3t > 3$$

$$t < -1$$



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Compound Inequalities

* more than one

$2x+1 \geq 3$ and $3x-4 \leq 17$
 $\begin{matrix} -1 & -1 \\ \hline 2x & \geq 2 \\ \hline x & \geq 1 \end{matrix}$ and $\begin{matrix} +4 & +4 \\ \hline 3x & \leq 21 \\ \hline x & \leq 7 \end{matrix}$
 $x \geq 1$ and $x \leq 7$
both

$-2x+5 \geq 3$ and $x-5 > -12$
 $\begin{matrix} -5 & -5 \\ \hline -2x & \geq -2 \\ \hline x & \leq 1 \end{matrix}$ and $\begin{matrix} +5 & +5 \\ \hline x & > -7 \end{matrix}$
 $x \leq 1$ and $x > -7$

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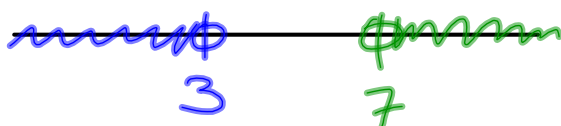
$5x+1 > 21$ or $3x+2 < -1$
 $\begin{matrix} -1 & -1 \\ \hline 5x & > 20 \\ \hline x & > 4 \end{matrix}$ or $\begin{matrix} -2 & -2 \\ \hline 3x & < -3 \\ \hline x & < -1 \end{matrix}$
 $x > 4$ or $x < -1$
either

$x > 2$ or $x < 6$

all real #s

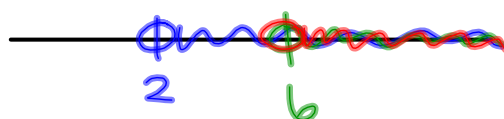
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$$\underline{x < 3} \text{ and } \underline{x > 7}$$



no sol.

$$\underline{x > 2} \text{ and } \underline{x > 6}$$



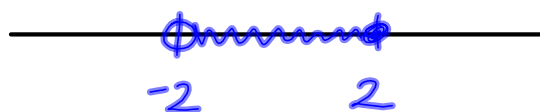
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and

$$\begin{matrix} -3 < 2x + 1 \leq 5 \\ -1 & & -1 \end{matrix}$$

$$\begin{matrix} -4 < 2x \leq 4 \\ \frac{-4}{2} < \frac{2x}{2} \leq \frac{4}{2} \end{matrix}$$

$$-2 < x \leq 2$$



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