

SOLVING INEQUALITIES

$$\frac{-2x}{-2} < \frac{16}{-2}$$

$$x > -8$$

$$-2 < -3$$

$$-2 > -3$$

$$1 + 5(x-8) < 2 - (x+5)$$

$$1 + 5x - 40 < 2 - x - 5$$

$$\begin{array}{rcl} 5x - 39 & < & -3 - x \\ +x & +39 & +39 + x \end{array}$$

$$\frac{6x}{6} < \frac{36}{6}$$

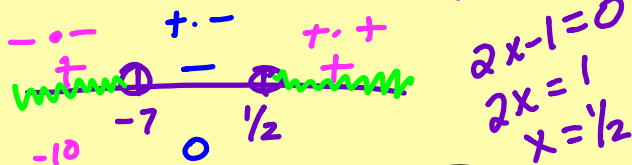
$$x < 6$$

$$8 > x$$



$$(x+7)(2x-1) > 0$$

+ values



$$x < -7 \text{ OR } x > \frac{1}{2}$$

Testing Points

* use when variables are multiplied or divided

- 1) Find where each quantity = 0.
- 2) Determine open/closed circles.
- 3) Test a point in each interval for + or -.
- 4) Using < 0 or > 0 , shade - or + solutions
- 5) Write the solution in symbols.

$$\frac{x+4}{(2-x)(3x+5)} \leq 0$$

↑ Negative Solution

$$3x+5=0$$

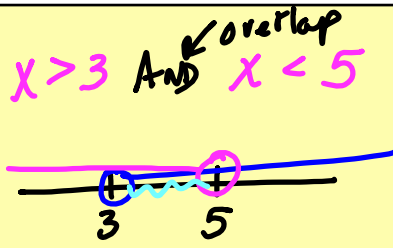
$$\frac{3x}{3} = \frac{-5}{3}$$

$$x = -\frac{5}{3}$$

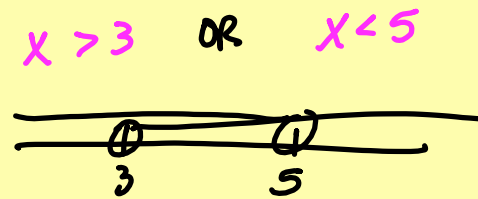
Number line diagram showing the solution set for the inequality:

The number line has points at -4 , $-\frac{5}{3}$, and 2 . The sign of the expression is positive for $x < -4$, negative for $-4 < x < -\frac{5}{3}$, positive for $-\frac{5}{3} < x < 2$, and negative for $x > 2$.

The solution set is $x \leq -4$ or $x > 2$.



$$3 < x < 5$$



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AND = overlap
OR = anything shaded

$$2m+7 < 5m-9 \leq 3m+2$$

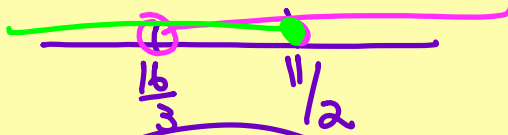
$$\begin{array}{l} 2m+7 < 5m-9 \\ -2m+9 \quad -2m+9 \end{array} \quad \text{AND} \quad \begin{array}{l} 5m-9 \leq 3m+2 \\ -3m+9 \quad -3m+9 \end{array}$$

$$\frac{16}{3} < \frac{3m}{3}$$

$$\frac{16}{3} < m \quad \text{AND}$$

$$\frac{2m}{2} \leq \frac{11}{2}$$

$$m \leq \frac{11}{2}$$

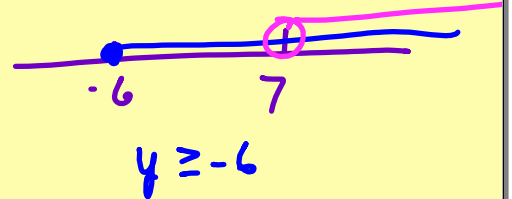


$$\frac{16}{3} < m \leq \frac{11}{2}$$

$$-3 \leq 2y+9 \quad \text{OR} \quad 18-4y < -10$$

$$\begin{array}{l} -12 \leq 2y \\ -6 \leq y \end{array}$$

$$\begin{array}{l} \frac{28}{4} < \frac{4y}{4} \\ 7 < y \end{array}$$



$$y \geq -6$$