

INEQUALITIES

$$1 + 5(x-8) \leq 2 - (x+5)$$

$$1 + 5x - 40 \leq 2 - x - 5$$

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

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

$$x \leq 6$$



$$8 < x$$

A number line with an open circle at 8. A green line segment extends to the right from the circle, indicating the solution set $8 < x$.

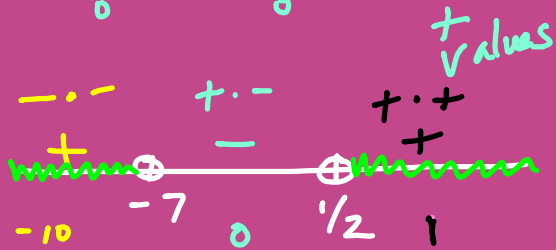
$$\frac{-3x}{-3} > \frac{12}{-3}$$

$$x < -4$$

$$-1 \cdot 2 < 5 \cdot -1$$

$$-2 > -5$$

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



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

Testing Points

* Use if variables are multiplied or divided.

1) Find where each quantity = 0.

$$2x-1=0$$

$$\frac{2x}{2} = \frac{1}{2}$$

2) Determine open/closed circles

3) Test a pt in each interval (gap) for + or -.

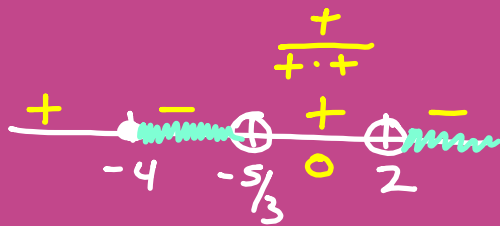
4) Using the < 0 or > 0 , shade the + or - solutions

5) Write solution in symbols.

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

↑ negative solutions

$$\begin{aligned} 3x+5 &= 0 \\ 3x &= -5 \\ x &= -\frac{5}{3} \end{aligned}$$



$$-4 \leq x < -\frac{5}{3} \text{ OR } x > 2$$

COMPOUND SENTENCES

$$x > 3 \text{ and } x < 5$$



$$3 < x < 5$$

AND = Intersection
OR = Everything shaded

$$x > 3 \text{ OR } x < 5$$



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$$x \leq -5 \text{ AND } x < 9$$



Intersection at: $x \leq -5$

$$x \leq -5 \text{ OR } x < 9$$



$$\boxed{x < 9}$$

OR = Everything Shaded

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

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

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

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

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

$5\frac{1}{3} \qquad \qquad \qquad 5\frac{1}{2}$



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

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

$-9 \quad -9 \qquad \qquad -18 \quad -18$

$$-\frac{12}{2} \leq \frac{2y}{2} \qquad \qquad -4y < -\frac{28}{-4}$$

$$-6 \leq y \quad \text{OR} \quad y > 7$$



OR = Everything Shaded

$$x \geq -6$$