

SOLVING INEQUALITIES

$$4n - 5(n-3) > 3(n+1) - 20$$

$$4n - 5n + 15 > 3n + 3 - 20$$

$$\begin{array}{r} -n + 15 > 3n - 17 \\ +n \quad +17 \end{array}$$

$$\frac{32}{4} > \frac{4n}{4}$$

$$8 > n$$

$$n < 8$$



$$\frac{-2n}{-2} < \frac{10}{-2}$$

$$n > -5$$

$$\therefore 2 < 10$$

$$-2 > -10$$

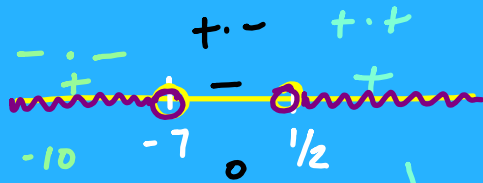
$$(x+7)(2x-1) > 0$$

+ solutions:

$$2x-1=0$$

$$2x=1$$

$$x=1/2$$



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

Testing Points

* Use when solving inequalities with * or ÷ of variables.

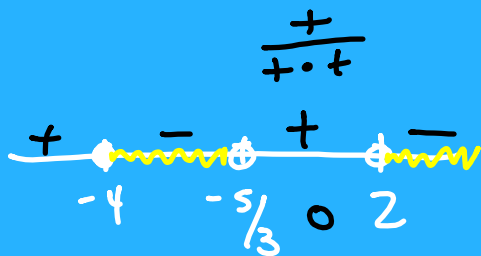
- 1) Find where each quantity = 0 + place # of number line.
- 2) Determine closed or open circles.
- 3) Test a pt. in each interval for + or -.
- 4) Using the inequality sign, shade the + or - solutions.
- 5) Write solution in symbols.

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

solution

$$\begin{aligned} x+4 &= 0 \\ x &= -4 \\ 2-x &= 0 \\ 2 &= x \end{aligned}$$

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



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

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

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

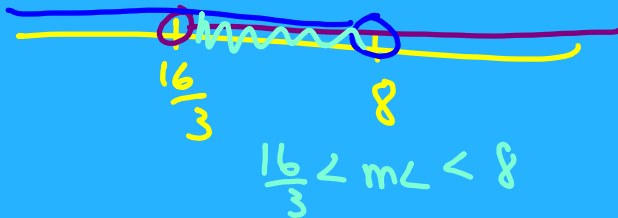
$$\begin{array}{r} -2m+9 \\ -2m \end{array} \quad \begin{array}{r} -3m+9 \\ -3m+9 \end{array}$$

$$\frac{16}{3} < \frac{8m}{3}$$

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

$$\frac{2m}{2} \leq \frac{16}{2}$$

$$m < 8$$



$$\begin{array}{r} -3 \leq 2y+9 \\ -9 \quad -9 \end{array} \quad \underline{\text{OR}} \quad \begin{array}{r} 18-4y < -10 \\ -18 \quad -18 \end{array}$$

$$-\frac{12}{2} \leq \frac{2y}{2}$$

$$-6 \leq y$$

$$\begin{array}{r} -4y < -28 \\ -4 \quad -4 \end{array}$$

$$y > 7$$

AND = Both
= Overlap

OR = ANYTHING
SHADED
(Does not have
to overlap)



$$r - 2 > 2(r + 4) > 8 - r$$

$$r - 2 > 2(r + 4)$$

$$\begin{array}{r} r - 2 > 2r + 8 \\ -r - 8 \quad -r - 8 \end{array}$$

$$-10 > r$$

AND

↑
must
overlap

$$2(r + 4) > 8 - r$$

$$\begin{array}{r} 2r + 8 > 8 - r \\ +r - 8 \quad -8 + r \end{array}$$

$$\frac{3r}{3} > \frac{0}{3}$$

$$r > 0$$



No solution

