Solving Inequalities

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

$x > -8$

$\cdot -1 \quad 2 < 3 \quad \cdot -1$

$-2 > -3$

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

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

$5x - 39 < -3 - x$

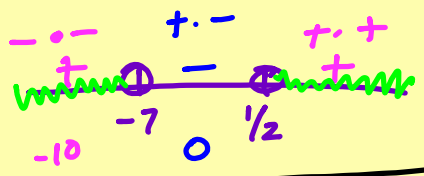
$+x \quad +39 \quad +39 + x$

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

$x < 6$

$8 > x$

$(x+7)(2x-1) \geq 0$ + values



$2x-1=0$
$2x=1$
$x=\frac{1}{2}$

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

Testing Points

* use when variables are multiplied or divided

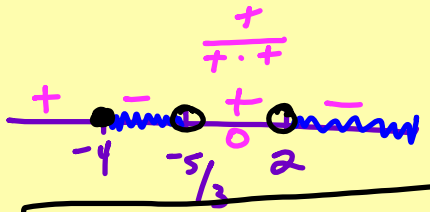
1) Find where each quantity $= 0$.
2) Determine open/closed circles.
3) Test a point in each interval for + or −.
4) Using < 0 or > 0, shade − or + solutions
5) Write the solution in symbols.

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

Negative Solutions

$3x+5=0$

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

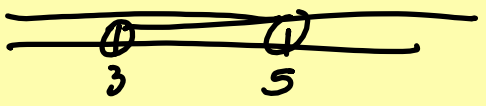


$-4 \leq x < -5/3$ OR $x > 2$

$x > 3$ AND $x < 5$ ← overlap

$3 < x < 5$

$x > 3$ OR $x < 5$



$\mathbb{R}$

AND = overlap
OR = anything shaded

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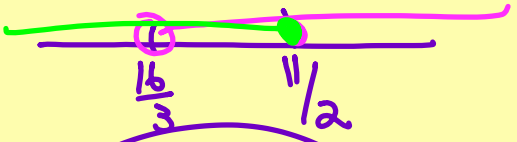
$2m+7 < 5m-9 \leq 3m+2$

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

$-2m \quad -2m$ $\quad +9 \quad +9$ $\quad -3m \quad -3m$ $\quad +9$

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

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



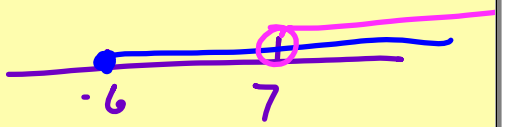
$\frac{16}{3} < m \leq \frac{11}{2}$

$-3 \leq 2y+9$ OR $18-4y < -10$

$-9 \quad -9$

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

$-6 \leq y$ $\quad 7 < y$



$y \geq -6$