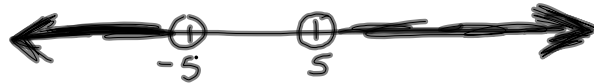


1-30-14
4th Trig

$$|x| > 5$$



$$|x| < 5$$



Ex: $|x+4| > 9$

$$\begin{array}{r} x+4 > 9 \\ -4 \quad -4 \\ \hline x > 5 \end{array} \quad \text{OR} \quad \begin{array}{r} \cancel{-}(x+4) > 9 \\ \hline \cancel{-} \quad \cancel{-} \\ x+4 < -9 \end{array}$$

$$\begin{array}{r} x+4 < -9 \\ -4 \quad -4 \\ \hline x < -13 \end{array}$$

$x > 5$ or $x < -13$



$$|x-1| < 7$$

$$\begin{array}{r} x-1 < 7 \\ +1 \quad +1 \\ \hline x < 8 \end{array} \quad \text{AND} \quad \begin{array}{r} \cancel{-}(x-1) < 7 \\ \hline \cancel{-} \quad \cancel{-} \\ x-1 > -7 \end{array}$$

$$\begin{array}{r} x-1 > -7 \\ +1 \quad +1 \\ \hline x > -6 \end{array}$$

$x < 8$ AND $x > -6$ $x > -6$



$-6 < x < 8$

$$|x+10| > 8$$

$$\begin{array}{l} x+10 > 8 \\ \underline{-10 \quad -10} \\ x > -2 \end{array} \quad \text{OR} \quad \begin{array}{l} -(x+10) > 8 \\ \underline{-1 \quad -1} \\ x+10 < -8 \\ \underline{-10 \quad -10} \\ x < -18 \end{array}$$

$$x > -2 \quad \text{OR} \quad x < -18$$

$$|2x-3| < 7$$

$$\begin{array}{l} 2x-3 < 7 \\ \underline{+3 \quad +3} \\ 2x < 10 \\ x < 5 \end{array} \quad \text{AND} \quad \begin{array}{l} -(2x-3) < 7 \\ \underline{-1 \quad -1} \\ 2x-3 > -7 \\ \underline{+3 \quad +3} \\ 2x > -4 \\ x > -2 \end{array}$$

AND

$$-2 < x < 5$$

$$|x-3| < -1$$

↑
positive

here

$$< -1$$

can't happen

No solution

\emptyset null set

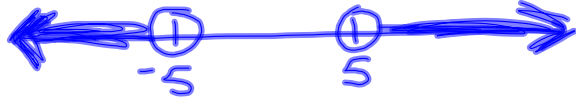
$$|2x-10| > -4$$

↑
positive > -4
Always true \mathbb{R}

1-30-14

3rd Trig

$$|x| \geq 5 \quad \text{or} \quad \text{and}$$



$$|x| < 5 \quad \text{and}$$



Ex: $|x-3| \geq 5$

$$\begin{array}{r} x-3 \geq 5 \\ +3 \quad +3 \\ \hline x \geq 8 \end{array}$$

OR

$$\frac{-x-3 \geq 5}{-1 \quad -1}$$

$$\begin{array}{r} x-3 \leq -5 \\ +3 \quad +3 \\ \hline x \leq -2 \end{array}$$

OR

$$x \leq -2$$

$$x \geq 8 \text{ OR } x \leq -2$$

$$|x-3| \leq 5$$

$$\begin{array}{r} x-3 \leq 5 \\ +3 \quad +3 \\ \hline x \leq 8 \end{array}$$

$$\text{AND } \frac{-(x-3) \leq 5}{-1 \quad -1}$$

$$\begin{array}{r} x-3 \geq -5 \\ +3 \quad +3 \\ \hline x \geq -2 \end{array}$$

$$x \leq 8 \text{ AND } x \geq -2$$



$$-2 \leq x \leq 8$$

$$|2x-1| > 9$$

$$\begin{array}{l} 2x-1 > 9 \\ +1 \quad +1 \\ \hline 2x > 10 \\ x > 5 \end{array} \quad \text{OR} \quad \begin{array}{l} -(2x-1) > 9 \\ -1 \quad -1 \\ \hline 2x-1 < -9 \\ +1 \quad +1 \\ \hline 2x < -8 \\ x < -4 \end{array}$$

$$x > 5 \text{ or } x < -4$$



Say we had

$$x > 2 \text{ AND } x < 10$$

$$2 < x < 10$$

$$|x-8| < -6$$

↓
+ number < -6
Never happens
No solution

\emptyset ← null set

$$|3x-100| > -2$$

↓
+ # > -2
Always true

\mathbb{R}