

$$1.) \begin{array}{r} |x| - 3 = 12 \\ +3 \quad +3 \end{array}$$

$$|x| = 15$$

$$\boxed{x = 15} \quad \boxed{x = -15}$$

$$3.) \begin{array}{r} |x - 8| = 15 \\ \swarrow \quad \searrow \end{array}$$

$$\begin{array}{r} x - 8 = 15 \\ +8 \quad +8 \end{array}$$

$$\boxed{x = 23}$$

$$\begin{array}{r} x - 8 = -15 \\ +8 \quad +8 \end{array}$$

$$\boxed{x = -7}$$

$$2.) \begin{array}{r} -4|x| = 28 \\ \hline -4 \quad -4 \end{array}$$

$$|x| = -7$$

**No solution**

$$4.) \begin{array}{r} |x + 3| + 7 = 20 \\ -7 \quad -7 \end{array}$$

$$|x + 3| = 13$$

$$\begin{array}{r} x + 3 = 13 \\ -3 \quad -3 \end{array}$$

$$\boxed{x = 10}$$

$$\begin{array}{r} x + 3 = -13 \\ -3 \quad -3 \end{array}$$

$$\boxed{x = -16}$$

$$\left| \frac{b}{7} \right| < 2$$

flip the inequality  
"opposite"

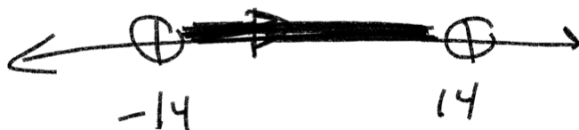
change the sign

$$7\left(\frac{b}{7}\right) < (2)7$$

$$b < 14$$

$$7\left(\frac{b}{7}\right) > (-2)7$$

$$b > -14$$



$$|x-6| < 4$$

$$x-6 < 4$$

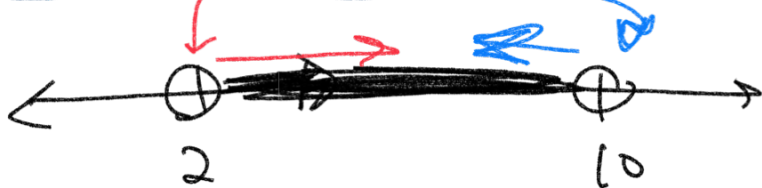
+6 +6

$$x-6 > -4$$

+6 +6

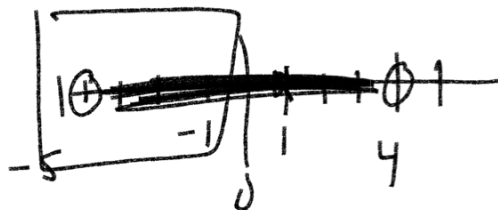
$$|x| < 10$$

$$|x| > 2$$



$$|x| < 4$$

4 -4



$$x < 4 \quad x > -4$$

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

always!  
all solutions!

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

Never!  
No solution!

$$1.) \frac{-4|x|}{-4} > \frac{3}{-4}$$

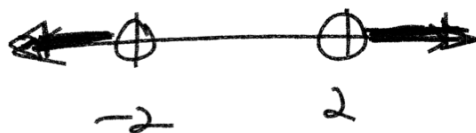
$$|x| < -\frac{3}{4}$$

no solution

$$2.) \frac{-4|x|}{-4} < \frac{-8}{-4}$$

$$|x| > 2$$

$$x > 2 \quad x < -2$$



$$3.) |4 + 9x| \leq 5$$

$$4 + 9x \leq 5$$

$$\frac{9x}{9} \leq \frac{1}{9}$$

$$x \leq \frac{1}{9}$$

$$4 + 9x \geq -5$$

$$\frac{9x}{9} \geq \frac{-9}{9}$$

$$x \geq -1$$



$$2 - 5|10x - 2| \geq -108$$

$$\begin{array}{l} -2 \qquad \qquad \qquad -2 \\ -5|10x - 2| \geq \frac{-110}{-5} \end{array}$$

$$|10x - 2| \leq 22$$

$$\begin{array}{l} 10x - 2 \leq 22 \\ +2 \qquad +2 \end{array}$$

$$\frac{10x}{10} \leq \frac{24}{10}$$

$$x \leq 2.4$$

$$\begin{array}{l} 10x - 2 \geq -22 \\ +2 \qquad +2 \end{array}$$

$$\frac{10x}{10} \geq \frac{-20}{10}$$

$$\boxed{x \geq -2}$$



$$\frac{|2x+6|}{4} - 8 \leq 12$$

+8            +8

$$4 \left( \frac{|2x+6|}{4} \right) \leq (20)4$$

$$|2x+6| \leq 80$$

$$2x+6 \leq 80$$

-6        -6

$$\frac{2x}{2} \leq \frac{74}{2}$$

$$x \leq 37$$

$$2x+6 \geq -80$$

-6        -6

$$\frac{2x}{2} \geq \frac{-86}{2}$$

$$x \geq -43$$

