


LAUD GOR

Inequalities with Absolute Value


P.1

1. $|x+5| \geq 2$
2. $|x-7| < 12$
3. $|2x-5| \geq 4$
4. $|3x+1| \leq 9$
5. $|x+1|-2 \leq 6$
6. $|2x-3|+5 \leq 9$
7. $|5x-1| < -2$
8. $|3x+7| > -5$
9. $|4x-3|+9 < 2$
10. $|x+3|+6 > 1$

① $|x+5| > 2$

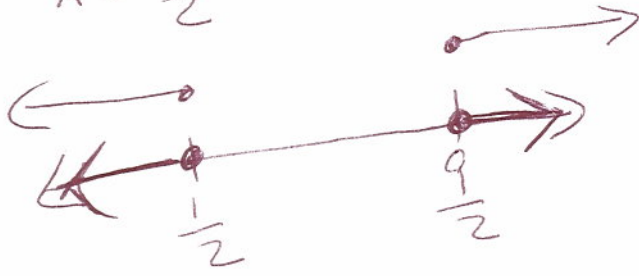
$$\begin{array}{l} x+5 > 2 \quad \text{OR} \quad x+5 < -2 \\ \underline{-5 \quad -5} \qquad \qquad \underline{-5 \quad -5} \\ x > -3 \qquad \qquad \qquad x < -7 \end{array}$$


② $|x-7| < 12$

$$\begin{array}{l} x-7 < 12 \quad \text{and} \quad x-7 > -12 \\ \underline{+7 \quad +7} \qquad \qquad \underline{+7 \quad +7} \\ x < 19 \qquad \qquad \qquad x > -5 \end{array}$$


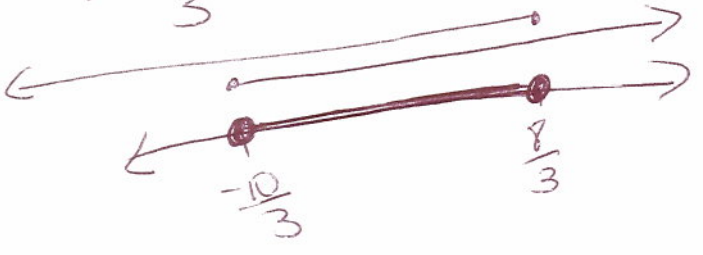
3) $|2x-5| \geq 4$

$$\begin{array}{r}
 2x-5 \geq 4 \quad \text{or} \quad 2x-5 \leq -4 \\
 +5 \quad +5 \qquad \qquad +5 \quad +5 \\
 \hline
 2x \geq 9 \qquad \qquad 2x \leq 1 \\
 \frac{2x}{2} \geq \frac{9}{2} \qquad \qquad \frac{2x}{2} \leq \frac{1}{2} \\
 x \geq \frac{9}{2} \qquad \qquad x \leq \frac{1}{2}
 \end{array}$$



4) $|3x+1| \leq 9$

$$\begin{array}{r}
 3x+1 \leq 9 \quad \text{and} \quad 3x+1 \geq -9 \\
 -1 \quad -1 \qquad \qquad -1 \quad -1 \\
 \hline
 3x \leq 8 \qquad \qquad 3x \geq -10 \\
 \frac{3x}{3} \leq \frac{8}{3} \qquad \qquad \frac{3x}{3} \geq \frac{-10}{3} \\
 x \leq \frac{8}{3} \qquad \qquad x \geq \frac{-10}{3}
 \end{array}$$



$$\textcircled{5} \quad |x+1| - 2 \leq 6$$

$$\quad \quad \quad +2 \quad +2$$

$$|x+1| \leq 8$$

$$x+1 \leq 8 \quad \text{and} \quad x+1 \geq -8$$

$$\quad \quad \quad -1 \quad -1 \quad \quad \quad -1 \quad -1$$

$$x \leq 7 \quad \quad \quad x \geq -9$$



P.3

$$\textcircled{6} \quad |2x-3| + 5 \leq 9$$

$$\quad \quad \quad -5 \quad -5$$

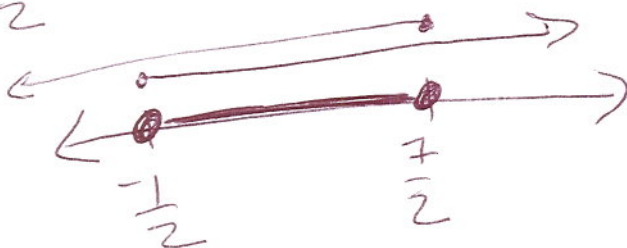
$$|2x-3| \leq 4$$

$$2x-3 \leq 4 \quad \text{and} \quad 2x-3 \geq -4$$

$$\quad \quad \quad +3 \quad +3 \quad \quad \quad +3 \quad +3$$

$$\frac{2x}{2} \leq \frac{7}{2} \quad \quad \quad \frac{2x}{2} \geq \frac{-1}{2}$$

$$x \leq \frac{7}{2} \quad \quad \quad x \geq \frac{-1}{2}$$



$$\textcircled{7} |5x-1| < -2$$

NO SOLUTION

P.4

Abs. value is always positive - it will never be less than -2.

$$\textcircled{8} |3x+7| > -5$$

All Real solutions

Absolute value is always positive - it will always be greater than -5.

$$\textcircled{9} |4x-3| + 9 < 2$$

$$\begin{array}{r} -9 \quad -9 \\ \hline \end{array}$$

$$|4x-3| < -7$$

NO SOLUTION
SAME AS #7

$$\textcircled{10} |x+3| + 6 > 1$$

$$\begin{array}{r} -6 \quad -6 \\ \hline \end{array}$$

$$|x+3| > -5$$

All Real sols.
SAME AS #8