

NAME _____

Intermediate Algebra
Practice Test over Linear Equations and Inequalities

#1 Solve the equation: $\frac{1}{8}x + \frac{3}{4} = 2$

#2 Solve the equation: $10 = -\frac{1}{3}(3x + 18) + 1$

#3 Solve the absolute value equation: $|x + 7| = 52$

#4 Solve the absolute value equation: $4|2x - 1| - 2 = 34$

#5 Solve the absolute value equation: $|4w - 13| = |4w + 10|$

#6 Solve the linear inequality: $\frac{2}{5}x + 9 \leq 29$.

#7 Solve the linear inequality: $-4x - 2 \leq -2x + 3$. Graph the solution set on a number line.

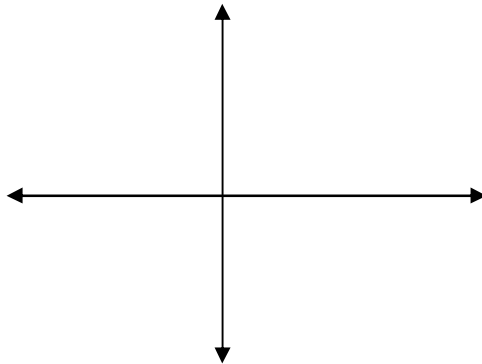
#8 Solve the linear inequality: $2 < x + 3 < 4$. Graph the solution set on a number line.

#9 Solve the absolute value inequality: $|x + 1| - 2 > 9$. Graph the solution set on a number line.

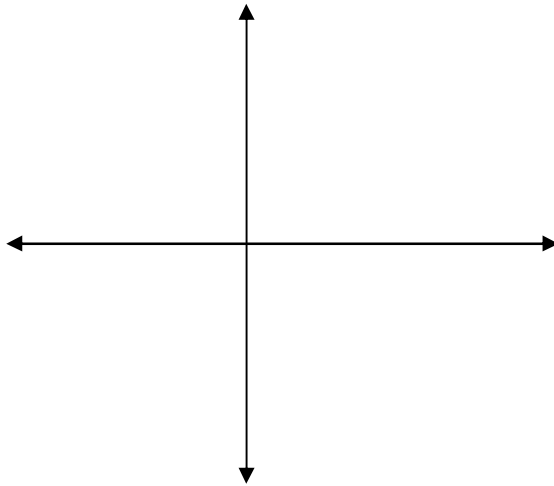
#10 Solve the absolute value inequality: $|5x - 7| - 11 \geq -10$. Write answer in set interval notation.

#11 Solve the absolute value inequality: $|\frac{1}{2}|\frac{2}{3}x + \frac{3}{4}| - \frac{7}{8} > \frac{3}{8}$.

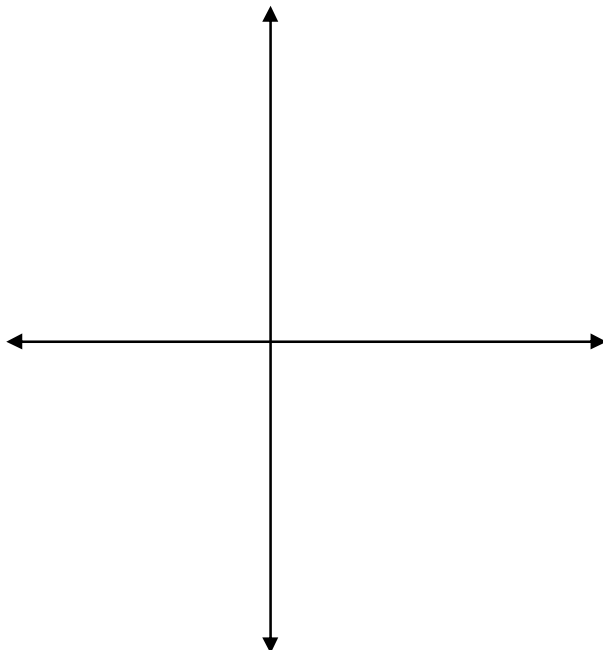
#12 Graph the linear equation on the provided Cartesian plane: $y = -2x - 3$.



#13 Graph the system of linear inequalities on the Cartesian plane: $y \leq 2$ and $x \leq 1$.



#14 Graph the linear inequality on the Cartesian plane: $x + 2y < 4$.



SOLUTIONS

#1 Solve the equation:

$$\begin{aligned}\frac{1}{8}x + \frac{3}{4} &= 2 \\ 8\left(\frac{1}{8}x + \frac{3}{4} = 2\right) \\ x + 6 &= 16\end{aligned}$$

$$x = 10$$

#2 Solve the equation:

$$\begin{aligned}10 &= -\frac{1}{3}(3x + 18) + 1 \\ 9 &= -\frac{1}{3}(3x + 18) \\ 9 &= -x - 6 \\ 15 &= -x\end{aligned}$$

$$-15 = x$$

#3 Solve the absolute value equation:

$$\begin{aligned}|x + 7| &= 52 \\ x + 7 &= 52 \quad \text{OR} \quad x + 7 = -52\end{aligned}$$

$$x = 45 \qquad x = -59$$

#4 Solve the absolute value equation:

$$\begin{aligned}4|2x - 1| - 2 &= 34 \\ 4|2x - 1| &= 36 \\ |2x - 1| &= 9 \\ 2x - 1 &= 9 \quad \text{OR} \quad 2x - 1 = -9 \\ 2x &= 10 \qquad \qquad 2x &= -8\end{aligned}$$

$$x = 5 \qquad x = -4$$

#5 Solve the absolute value equation:

$$\begin{aligned}|4w - 13| &= |4w + 10| \\ 4w - 13 &= 4w + 10 \quad \text{OR} \quad 4w - 13 = -4w - 10 \\ -13 &= 10 \quad \text{OR} \quad 8w - 13 = -10 \\ \text{no solution} & \quad \text{OR} \quad 8w &= 3\end{aligned}$$

$$w = \frac{3}{8}$$

#6 Solve the linear inequality:

$$\frac{2}{5}x + 9 \leq 29$$

$$5\left(\frac{2}{5}x + 9 \leq 29\right)$$

$$2x + 45 \leq 145$$

$$2x \leq 100$$

$$x \leq 50$$

$$x \leq 50$$

#7 Solve the linear inequality: $-4x - 2 \leq -2x + 3$. Graph the solution set on a number line.

$$-2x - 2 \leq +3$$

$$-2x \leq 5$$

$$x \geq -\frac{5}{2}$$



#8 Solve the linear inequality: $2 < x + 3 < 4$. Graph the solution set on a number line.

$$-1 < x < 1$$

$$-1 < x < 1$$



#9 Solve the absolute value inequality: $|x + 1| - 2 > 9$. Graph the solution set on a number line.

$$|x + 1| > 11$$

$$x + 1 > 11$$

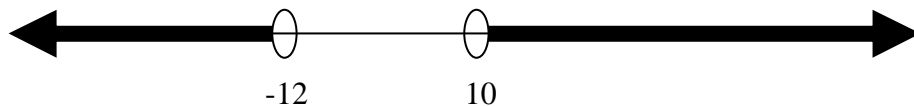
OR

$$x + 1 < -11$$

$$x > 10$$

OR

$$x < -12$$



#10 Solve the absolute value inequality: $|5x - 7| - 11 \geq -10$. Write answer in set interval notation.

$$|5x - 7| \geq 1$$

$$5x - 7 \geq 1$$

OR

$$5x - 7 \leq -1$$

$$5x \geq 8$$

OR

$$5x \leq 6$$

$$x \geq \frac{8}{5}$$

OR

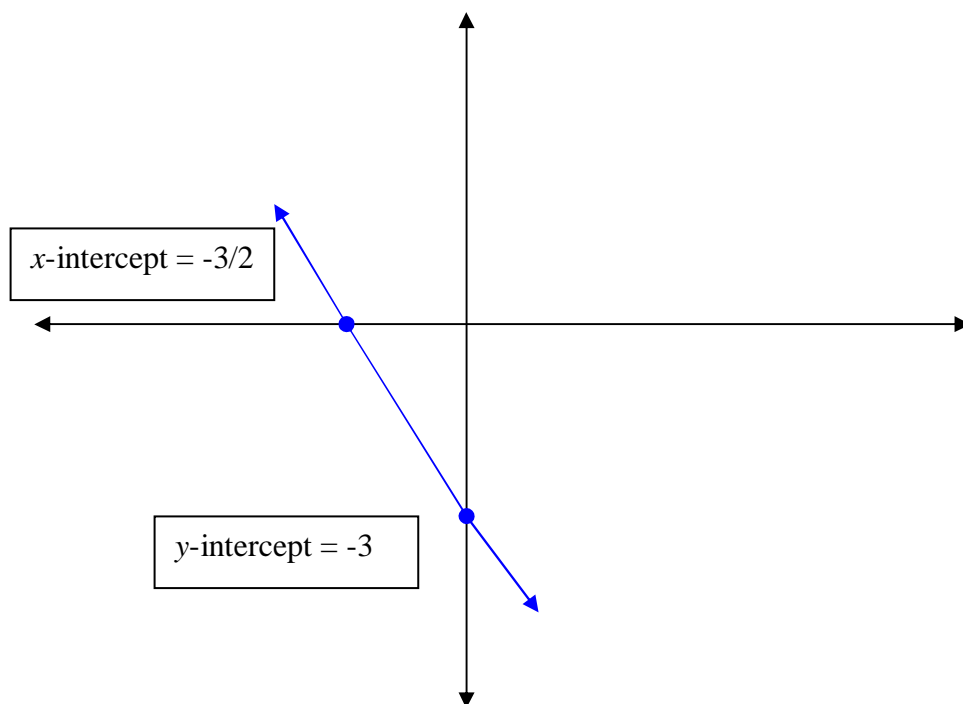
$$x \leq \frac{6}{5}$$

$$\left(-\infty, \frac{6}{5}\right] \cup \left[\frac{8}{5}, \infty\right)$$

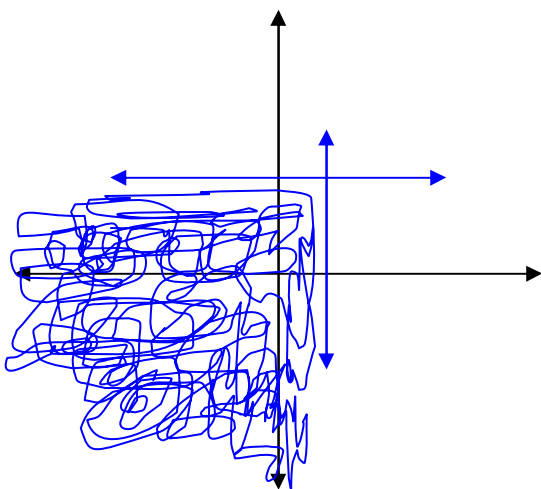
#11 Solve the absolute value inequality: $\frac{1}{2}|\frac{2}{3}x + \frac{3}{4}| - \frac{7}{8} > \frac{3}{8}$.

$$\begin{aligned}2\left(\frac{1}{2}\left|\frac{2}{3}x + \frac{3}{4}\right| - \frac{7}{8}\right) &> \left(\frac{3}{8}\right)2 \\2 \cdot \frac{1}{2}\left|\frac{2}{3}x + \frac{3}{4}\right| - 2 \cdot \frac{7}{8} &> \frac{3}{4} \\ \left|\frac{2}{3}x + \frac{3}{4}\right| - \frac{7}{4} &> \frac{3}{4} \\ \left|\frac{2}{3}x + \frac{3}{4}\right| &> \frac{10}{4} \\ \frac{2}{3}x + \frac{3}{4} > \frac{10}{4} \quad \text{OR} \quad \frac{2}{3}x + \frac{3}{4} < -\frac{10}{4} \\ 12\left(\frac{2}{3}x + \frac{3}{4} > \frac{10}{4}\right) \quad \text{OR} \quad 12\left(\frac{2}{3}x + \frac{3}{4} < -\frac{10}{4}\right) \\ 8x + 9 > 30 \quad \text{OR} \quad 8x + 9 < -30 \\ 8x > 21 \quad \text{OR} \quad 8x < -39 \\ x > \frac{21}{8} \quad \text{OR} \quad x < -\frac{39}{8}\end{aligned}$$

#12 Graph the linear equation on the provided Cartesian plane: $y = -2x - 3$.



#13 Graph the system of linear inequalities on the Cartesian plane: $y \leq 2$ and $x \leq 1$.



#14 Graph the linear inequality on the Cartesian plane: $x + 2y < 4$.

