

Name: Key

Period: _____

Homework for Compound Inequalities: Intersections

★ Circle only what's graphed

Solve and graph each of the following inequalities. Show all your work.

★ $-4 > x + 3 > 5$
 $\frac{-3}{-3} \quad \frac{-3}{-3} \quad \frac{-3}{-3}$
 $\frac{-7 > x > 2}{}$
 or
 $x < -7$ and $x > 2$
No solution

2.) $-1 < x + 1 \leq 6$
 $\frac{-1}{-1} \quad \frac{-1}{-1} \quad \frac{-1}{-1}$
 $-2 < x \leq 5$ or $x > -2$ and $x \leq 5$

3.) $1 < 2x + 5 \leq 9$
 $\frac{-5}{-5} \quad \frac{-5}{-5} \quad \frac{-5}{-5}$
 $\frac{-4 < 2x \leq 4}{2} \quad \frac{-4}{2} \quad \frac{4}{2}$
 $-2 < x \leq 2$ or $x > -2$ and $x \leq 2$

★ $-6 \leq x + 3 \geq 4$
 $\frac{-3}{-3} \quad \frac{-3}{-3} \quad \frac{-3}{-3}$
 $-9 \leq x \geq 1$ or $x \geq -9$ and $x \leq 1$

★ $6 < 2x + 1 > 4$
 $\frac{-1}{-1} \quad \frac{-1}{-1} \quad \frac{-1}{-1}$
 $\frac{5 < 2x > 3}{2} \quad \frac{5}{2} \quad \frac{3}{2}$
 $\frac{3}{2} < x > \frac{5}{2}$ or $x > \frac{5}{2}$ and $x > \frac{3}{2}$

6.) $-18 \leq -2x - 7 < 0$
 $\frac{+7}{+7} \quad \frac{+7}{+7} \quad \frac{+7}{+7}$
 $\frac{-11 \leq -2x < 7}{-2} \quad \frac{-11}{-2} \quad \frac{7}{-2}$ Flip!
 $\frac{11}{2} \geq x > \frac{7}{2}$ or $x \leq \frac{11}{2}$ and $x > \frac{7}{2}$
 $-\frac{7}{2} < x \leq \frac{11}{2}$

★ $15 < 4x + 3 \leq 7$
 $\frac{-3}{-3} \quad \frac{-3}{-3} \quad \frac{-3}{-3}$
 $\frac{12 < 4x \leq 4}{4} \quad \frac{12}{4} \quad \frac{4}{4}$
 $3 < x \leq 1$ or $x \leq 1$ and $x > 3$
No solution

8.) $-5 \geq -3x - 20 > -35$
 $\frac{+20}{+20} \quad \frac{+20}{+20} \quad \frac{+20}{+20}$
 $\frac{15 \geq -3x > -15}{-3} \quad \frac{15}{-3} \quad \frac{-15}{-3}$ FLIP!
 $-5 \leq x < 5$ or $x \geq -5$ and $x < 5$

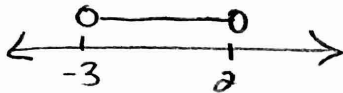
Notation is least to greatest

$$9.) -7 < 2x - 1 < 3$$

$$\begin{array}{r} +1 \quad +1 \quad +1 \\ \hline \end{array}$$

$$-6 < \frac{2x}{2} < \frac{4}{2}$$

$$\boxed{-3 < x < 2} \quad \text{or} \quad \boxed{x < 2 \text{ and } x > -3}$$



$$11.) -2 < 4x - 8 < 10$$

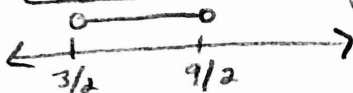
$$\begin{array}{r} +8 \quad +8 \quad +8 \\ \hline \end{array}$$

$$\frac{6}{4} < \frac{4x}{4} < \frac{18}{4}$$

$$\frac{3}{2} < x < \frac{9}{2}$$

$$\boxed{\frac{3}{2} < x < \frac{9}{2}}$$

$$\text{or} \quad \boxed{x > \frac{3}{2} \text{ and } x < \frac{9}{2}}$$



$$13.) 4b + 18 \leq -12b - 14 \leq 14 - 5b$$

$$\begin{array}{r} 4b + 18 \leq -12b - 14 \quad \text{and} \quad -12b - 14 \leq 14 - 5b \\ +12b \quad +12b \quad +12b \quad +12b \end{array}$$

$$\frac{16b + 18 \leq -14}{-18 \quad -18}$$

$$\frac{-14 \leq 14 + 7b}{-14 \quad -14}$$

$$\frac{16b \leq -32}{16 \quad 16}$$

$$\frac{-28 \leq 7b}{7 \quad 7}$$

$$b \leq -2$$

$$\boxed{-4 \leq b \leq -2}$$

$$-4 \leq b$$



$$15.) 5v + 10 \leq -4v - 17 < 9 - 2v$$

$$\begin{array}{r} 5v + 10 \leq -4v - 17 \quad \text{and} \quad -4v - 17 < 9 - 2v \\ +4v \quad +4v \quad +4v \quad +4v \end{array}$$

$$\frac{9v + 10 \leq -17}{-10 \quad -10}$$

$$\frac{-17 < 9 + 2v}{-9 \quad -9}$$

$$\frac{9v \leq -27}{9 \quad 9}$$

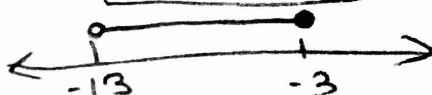
$$\frac{-26 < 2v}{2 \quad 2}$$

$$v \leq -3$$

and

$$-13 < v$$

$$\boxed{-13 < v \leq -3}$$



$$*10.) 7 < 5x - 3 \geq -8$$

$$\begin{array}{r} +3 \quad +3 \quad +3 \\ \hline \end{array}$$

$$\frac{10 < 5x \geq -5}{5 \quad 5 \quad 5}$$

$$2 < x \geq -1$$

$$-1 \leq \boxed{x > 2} \quad \text{or} \quad \boxed{x \geq -1 \text{ and } x > 2}$$



$$12.) -3 > 7 - 10x \geq -33$$

$$\begin{array}{r} -7 \quad -7 \quad -7 \\ \hline \end{array}$$

$$\frac{-10 > -10x \geq -40}{-10 \quad -10 \quad -10}$$

Flip!

$$\boxed{1 < x \leq 4} \quad \text{or} \quad \boxed{x > 1 \text{ and } x \leq 4}$$



$$14.) -3 \leq 7x - 17 < 18$$

$$\begin{array}{r} +17 \quad +17 \quad +17 \\ \hline \end{array}$$

$$\frac{14 \leq 7x < 35}{7 \quad 7 \quad 7}$$

$$\boxed{2 \leq x < 5} \quad \text{or} \quad \boxed{x \geq 2 \text{ and } x < 5}$$



$$*11.) -22 \geq 3x - 4 \geq 11$$

$$\begin{array}{r} +4 \quad +4 \quad +4 \\ \hline \end{array}$$

$$\frac{-18 \geq 3x \geq 15}{3 \quad 3 \quad 3}$$

$$-6 \geq x \geq 5 \quad \text{or} \quad \boxed{x \leq -6 \text{ and } x \geq 5}$$

No solution

