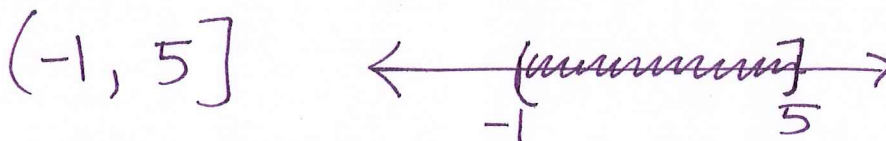


Name(s): KEY
Name(s): _____

Work with partners in groups of 2-4. **This is required.**

1. Write the following using interval notation. Plot the solution on the real number line.

$$-1 < x \leq 5$$



2. Write the following as an inequality using x .

$$[3, \infty)$$

$$x \geq 3$$

3. Find a and b so that the following is true:
If $-3 < x < 2$ then $a < x - 6 < b$

$$-3 < x < 2$$

$$-9 < x - 6 < -4 \quad \therefore \boxed{a = -9, b = -4}$$

4. Answer "true" or "false" to the following statements. If the statement is false, explain why.

- (a) $|x| \geq 0$ for all x .

true

- (b) $|y| \geq 5$ means $y \geq 5$ or $y \geq -5$.

false: $|y| \geq 5$ means
 $y \geq 5$ or $y \leq -5$

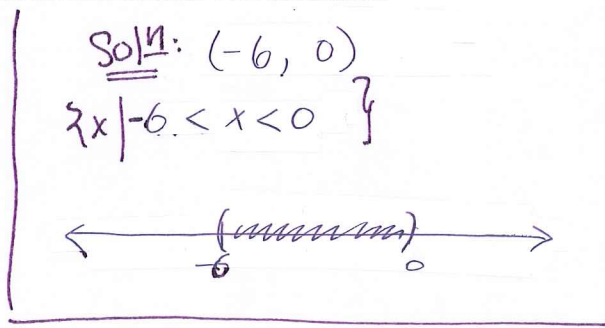
- (c) $1 > x > 4$ is a valid interpretation of $(-\infty, 1) \cup (4, \infty)$.

no, because there is no number both
greater than 4 and less than 1.
Should be: $x < 1$ or $x > 4$.

5. Solve the following expressions. Give your answer in both interval and set notation. Plot the solution on the real number line.

(a) $1 < 1 - \frac{1}{2}x < 4$

$$\begin{aligned} 1 < 1 - \frac{1}{2}x & \qquad 1 - \frac{1}{2}x < 4 \\ 0 < -\frac{1}{2}x & \qquad -\frac{1}{2}x < 3 \\ 0 > \frac{1}{2}x & \qquad \frac{1}{2}x > 3 \\ 0 > x & \qquad x > -6 \end{aligned}$$



(b) $\left| \frac{2x+1}{3x+4} \right| = 1$

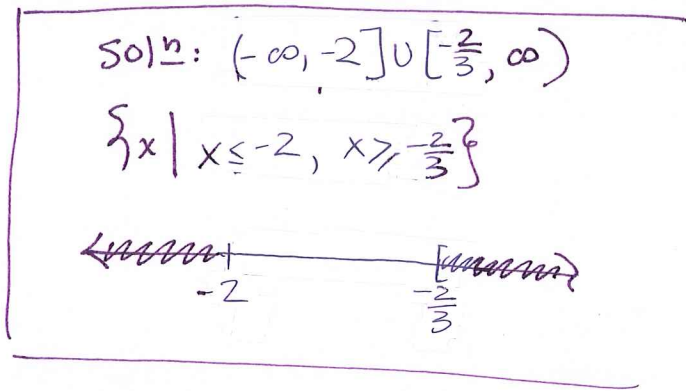
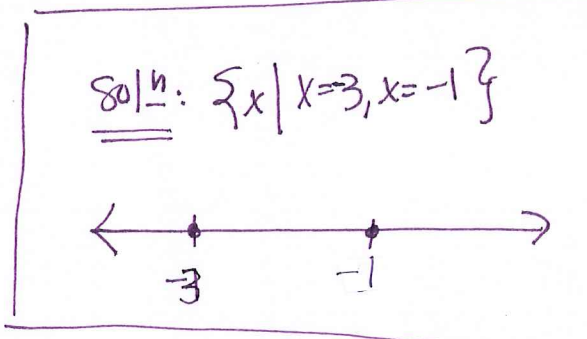
$$\frac{2x+1}{3x+4} = 1 \quad \text{or} \quad \frac{2x+1}{3x+4} = -1$$

$$\begin{aligned} 2x+1 = 3x+4 & \quad \text{or} \quad 2x+1 = -3x-4 \\ -x = 3 & \qquad \qquad \qquad 5x = -5 \\ x = -3 & \qquad \qquad \qquad x = -1 \end{aligned}$$

(c) $|3x+4| \geq 2$

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

$$\begin{aligned} 3x \geq -2 & \qquad \qquad \qquad 3x \leq -6 \\ x \geq -\frac{2}{3} & \qquad \qquad \qquad x \leq -2 \end{aligned}$$



(d) $|1-4x| - 7 < -2$

$$|1-4x| < 5$$

$$-5 < 1-4x < 5$$

$$\begin{aligned} -6 < -4x & \quad \text{or} \quad -4x < 4 \\ \frac{3}{2} > x & \quad \text{or} \quad x > -1 \end{aligned}$$

