

Directions: Please show all your work and be neat and organized to receive credit.

1. (24 points) Solve each of the following equations or inequalities. Write your answer in set notation and graph the solution set on a number line.

a. $|3x - 5| - 4 = 10$

$$|3x - 5| - 4 = 10$$

$$+4 \quad +4$$

$$|3x - 5| = 14$$

$$3x - 5 = 14, \quad 3x - 5 = -14$$

$$+5 \quad +5, \quad +5 \quad +5$$

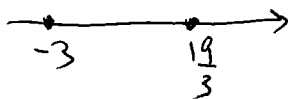
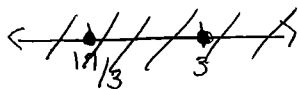
$$\frac{3x}{3} = \frac{19}{3}$$

$$x = \frac{19}{3}$$

$$\frac{3x}{3} = \frac{-9}{3}$$

$$x = -3$$

$$\left\{ x \mid x = -3, \frac{19}{3} \right\} \quad \checkmark$$



b. $|x + 15| \leq 4$

$$-4 \leq x + 15 \leq 4$$

$$-15 \quad -15 \quad -15$$

$$\left\{ x \mid -19 \leq x \leq -11 \right\}$$



b. $|5x + 3| > 14$

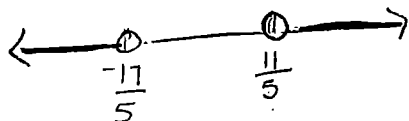
$$5x + 3 > 14 \quad \text{or} \quad 5x + 3 < -14$$

$$-3 \quad -3 \quad \quad \quad -3 \quad -3$$

$$\frac{5x}{5} > \frac{11}{5} \quad \text{or} \quad \frac{5x}{5} < \frac{-17}{5}$$

$$x > \frac{11}{5} \quad \text{or} \quad x < \frac{-17}{5}$$

$$\left\{ x \mid x < \frac{-17}{5} \quad \text{or} \quad x > \frac{11}{5} \right\}$$



d. $7 + 2|8x - 5| = 3$

$$7 + 2|8x - 5| = 3$$

$$-7 \quad \quad \quad -7$$

$$2|8x - 5| = \frac{-4}{2}$$

$$|8x - 5| = -2$$

NO SOLUTION

distance is never negative.

(24)

2. (6 points) The distance (in miles) of a car from Seattle t hours after 2:00 pm is given by the function

$$D(t) = |50t - 110|, \quad 0 \leq t \leq 7.$$

Find all times when the car is at least 30 miles from Seattle. Answer with a sentence. Fold the paper and do this problem on the back.

$$|50t - 110| \geq 30 \text{ mi}$$

$$50t - 110 \geq 30 \text{ mi} \quad \text{or} \quad 50t - 110 \leq -30 \text{ mi}$$

$$\frac{50t}{50} \geq \frac{140}{50}$$

$$t \geq \frac{14}{5} \quad \text{or}$$

$$\frac{50t}{50} \leq \frac{80}{50} \quad \checkmark$$

$$t \leq \frac{8}{5}$$

$$\frac{60}{60} = 120$$

$$\left\{ t \mid t \leq \frac{8}{5} \text{ or } t \geq \frac{14}{5} \right\}$$

$$\begin{array}{r} 2 \text{ pm} \\ \hline 1 \\ \times 12 \\ \hline 12 \\ \times 8 \\ \hline 96 \\ - 40 \\ \hline 36 \end{array}$$

$$\begin{array}{r} 24 \\ \times 12 \\ \hline 28 \\ - 140 \\ \hline 168 \\ - 120 = 2 \text{ hrs} \\ \hline 48 \end{array}$$

3:36

The car is at least 30 miles from
Seattle between 2 and 3:36
or between 4:48 and 9