Math 1010 - Quiz 3

University of Utah

Fall 2009

Name: _____Solutions_____

1. Find the values of x that satisfy the equation: (4 points)

$$|4x + 3| = |2x - 1|$$

Case 1:

$$4x + 3 = 2x - 1$$

$$\Rightarrow 2x = -4$$

$$\Rightarrow \boxed{x = -2}$$

Case 2:

$$4x + 3 = -2x + 1$$

$$\Rightarrow 6x = -2$$
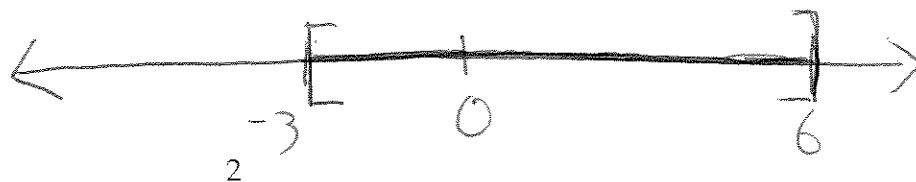
$$\Rightarrow \boxed{x = -\frac{1}{3}}$$

2. Find the values of x that satisfy the inequality below, and graph them on the number line: (4 points)
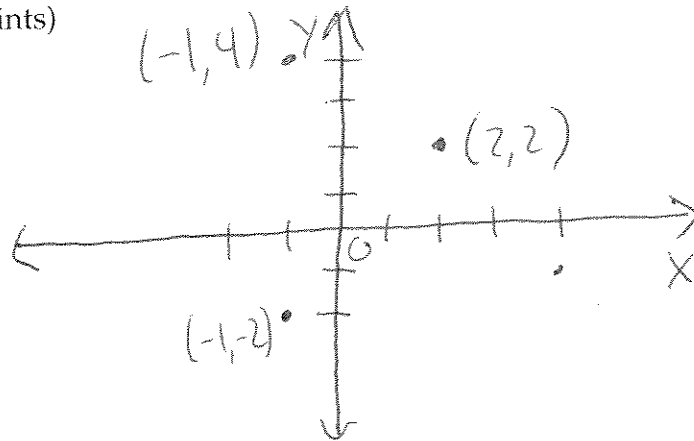
$$|2x - 3| \le 9$$

$$-9 \le 2x - 3 \le 9$$

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

$$\Rightarrow -6 \le 2x \le 12$$

$$\Rightarrow \boxed{-3 \le x \le 6}$$

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3. Draw an xy-plane, and graph the following points: $(-1, 4), (-1, -2), (2, 2)$. (2 points)

$(-1, 4)$ • y

• $(2, 2)$

O

X

$(-1, -2)$ •

4. Find the straight-line distances between the following points:

(a) $(-1, 4)$ and $(-1, -2)$. (2 points)

Same vertical line:

$|4 - (-2)| = |6| = \boxed{6}$

(b) $(-1, -2)$ and $(2, 2)$. (3 points)

$$d = \sqrt{(2 - (-1))^2 + (2 - (-2))^2}$$

$$= \sqrt{3^2 + 4^2}$$

$$= \sqrt{9 + 16} \qquad = \sqrt{25} = \boxed{5}$$