First Name: Last Name: KEY

Math 25 - Fall 2016

Quiz 1: Wednesday August 17, 2016

1. (3 points) Solve the following inequality and write the answer in interval notation:

$$2 \leq |3x - 1| - 6$$

$8 \leq |3x-1|$

$8 \leq 3x-1$ $\quad$ $8 \leq -3x+1$

$9 \leq 3x$ $\quad$ $3x \leq -7$

$3 \leq x$ $\quad$ $x \leq -7/3$

$\Rightarrow \boxed{(-\infty, -7/3] \cup [3, \infty)}$

2. (3 points) Compute the average rate of change of the following function from $x = 1$ to $x = 2$:

$$f(x) = x^3 - 2$$

$$ARC = \frac{f(x_2) - f(x_1)}{x_2 - x_1} = \frac{2^3 - 2 - (1^3 - 2)}{2 - 1}$$

$$= 8 - 1$$

$$= \boxed{7}$$

Please, show all work.

3. (3 points) A car has a 15 gallon gas tank and gets 30 miles to the gallon on a highway when driving on the freeway.

a) Write the function $G(x)$ which gives the amount of gas left in the tank after x miles.

b) Find $G(300)$. What does this tell us?

c) How far can the car travel before it runs out of gas?

a) $G(x) = 15 - \frac{1}{30}x$

b) $G(300) = 15 - \frac{300}{30} = 15 - 10 = 5 \Rightarrow$ 5 gal. left in tank after 300 mi.

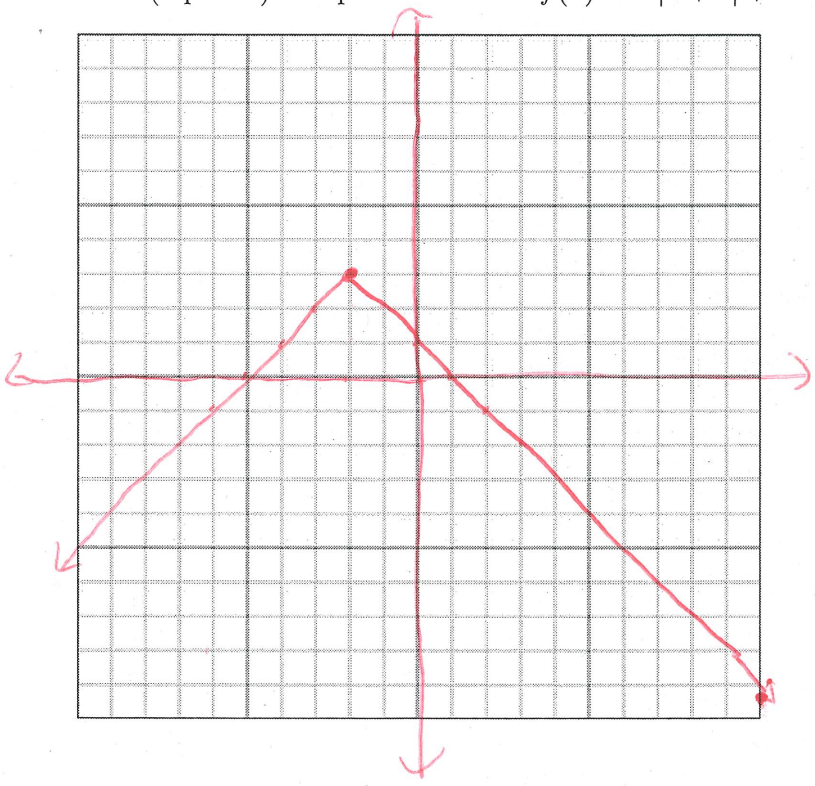
c) Solve $0 = 15 - \frac{1}{30}x$

$\frac{1}{30}x = 15$

$x = (15)(30)$

$\boxed{x = 450 \text{ mi}}$

4. (3 points) Graph the function $f(x) = -|x+2| + 3$



$f(x) = |x|$ parent graph

$|x+2|$ horiz. trans.

$-|x+2|$ reflection over x-axis

$-|x+2|+3$ vert shift up 3 units

Please, show all work.