Math 0099
University of North Georgia
Spring 2015
Quiz #6

Name: Key Date: March 6, 2015

1. It's perfect kite-flying weather today! Anneke grabs her kite, climbs up on the roof of her apartment, and begins playing out the kite string. In 10 seconds, Anneke's kite is 120 feet above the ground. After 20 seconds, it is 220 feet above the ground. Assume that the height h of the kite above the ground is a linear function of the amount of time t that has passed since Anneke began playing out the kite string.

   a.) Determine the slope of the line, including its units and give a real world explanation of the meaning of this slope. (4 pts.)

   (10 sec, 120 ft) & (20 sec, 220)

   $$m = \frac{220 - 120}{20 - 10} = \frac{100}{10} = \frac{10 \text{ feet}}{1 \text{ sec.}}$$

   The kite is increasing 10 feet per second.

   b.) Determine an equation that models the height h of the kite as a function of time t. (2 pts.)

   $$120 = 10(10) + b$$
   $$120 = 100 + b$$
   $$20 = b$$

   $$\boxed{\text{feet} = 10 \cdot \text{sec} + 20 \text{ ft}}$$

   c.) Determine the height of the kite after 40 seconds. (2 pts.)

   $$\text{feet} = 10(40) + 20$$
   $$= 400 + 20$$
   $$\boxed{\text{feet} = 420 \text{ ft}}$$

   d.) Determine the height of Anneke's apartment. (2 pts.)

   $$\text{feet} = 10(0) + 20$$
   $$\boxed{\text{feet} = 20}$$

2. Solve the system using the ***Elimination*** method (5 pts.)

① $8x + 11y = -16$
② $2x + 3y = -4$

$$\begin{cases} 8x + 11y = -16 \\ -4(2x + 3y = -4) \end{cases}$$

$$\begin{cases} 8x + 11y = -16 \\ -8x - 12y = 16 \end{cases}$$

$$y = 0$$

$$8x + 11(0) = -16$$
$$8x = -16$$
$$x = -2$$

$(-2, 0)$

Check

① $8(-2) + 11(0) = -16$
$-16 = -16$ ✓

② $2(-2) + 3(0) = -4$
$-4 = -4$ ✓

3. Solve the system using the ***Substitution*** method. (5 pts.)

① $3x - y = 1$
② $2x - 3y = 10$

① $\boxed{3x - 1} = y$

② $2x - 3(3x - 1) = 10$
$2x - 9x + 3 = 10$
$-7x + 3 = 10$
$-7x = 7$
$x = -1$

① $3(-1) - y = 1$
$-3 - y = 1$
$-y = 4$
$y = -4$

$(-1, -4)$

Check

① $3(-1) - (-4) = 1$
$-3 + 4 = 1$
$1 = 1$ ✓

② $2(-1) - 3(-4) = 10$
$-2 + 12 = 10$
$10 = 10$ ✓