

MONTGOMERY COLLEGE
Department of Mathematics
Rockville Campus

MA 103 KATIRAJE QUIZ #3 Form A SECTIONS (3.1, 3.2, 3.3) FALL 2007

NAME Solution

SCORE: / 20

*** RETAIN ALL GRADED PAPERS FOR YOUR RECORDS ***

1) Solve the following algebraically (2 Points Each)
(please give your answers in interval notation)

a) $10 \left(\frac{3-5x}{5} \leq \frac{1}{2}x+7 \right) 10$

$$2(3-5x) \leq 5x+70$$

$$\begin{array}{r} 6-10x \leq 5x+70 \\ -6-5x \quad -5x-6 \end{array}$$

$$-15x \leq 64$$

$$x \geq \frac{-64}{15}$$

$$\boxed{\left[\frac{-64}{15}, \infty \right)}$$

c) $3.1(3-2x) \leq -2.9x$

$$\begin{array}{r} 9.3-6.2x \leq -2.9x \\ +6.2x \quad +6.2x \end{array}$$

$$9.3 \leq 3.3x$$

$$2.8181 \leq x$$

$$\boxed{\left[2.81, \infty \right)}$$

2) Solve the following equations:

a. $\frac{3x}{3} - \frac{2x}{4} = \frac{1}{6}$

$$12 \frac{3x}{3} - 12 \frac{2x}{4} = 12 \frac{1}{6}$$

$$12x - 6x = 2$$

$$6x = 2$$

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

b) $6 \left(-\frac{5}{2}x + \frac{1}{3} \leq 2 \right) 6$

$$\begin{array}{r} -15x+2 \leq 12 \\ -2 \quad -2 \end{array}$$

$$-15x \leq 10$$

$$-15x \leq 10$$

$$x \geq \frac{10}{-15} \quad x \geq \frac{-2}{3}$$

$$\boxed{\left[\frac{-2}{3}, \infty \right)}$$

d) $4 \left(-\frac{5}{4}x + \frac{1}{2} \leq 2 \right)$

$$-5x+2 \leq 8$$

$$-5x \leq 6$$

$$x \geq \frac{6}{-5}$$

$$\boxed{\left[\frac{-6}{5}, \infty \right)}$$

b. $\frac{3x+1}{3} = \frac{2x-1}{3}$

$$3(3x+1) = 3(2x-1)$$

$$\begin{array}{r} 9x+3 = 6x-3 \\ -6x-3 \quad -6x-3 \end{array}$$

$$3x = -6$$

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

(1990, 30) (1995, 345)

- 2) In 1990 a bus company had 30 busses; in 1995 the company had 345 busses. Let $f(x)$ represents the number of busses. Assume $f(x)$ is a linear function. (2 Points Each)

- a. Find the slope of $f(x)$, and state what the slope represents in terms of the story?

$$m = \frac{345 - 30}{1995 - 1990} = 63$$

Every year the number of busses increases by 63 Busses.

- b. Use your slope and one ordered pair to write the equation for $f(x)$.

$$30 = 63(1990) + b \Rightarrow b = -125340$$

$$f(x) = 63x - 125340$$

- c. Predict the number of busses in the year 2007.

$$f(2007) = 63(2007) - 125340 = 1101 \text{ Busses}$$

- d. Determine the year when number of busses will be 1227.

$$\begin{array}{r} 1227 = 63x - 125340 \\ + 125340 \quad \quad + 125340 \\ \hline \end{array}$$

$$126567 = 63x \Rightarrow x = \frac{126567}{63} = 2009$$

The year will be 2009

MONTGOMERY COLLEGE
Department of Mathematics
Rockville Campus

MA 103 KATIRAIIE QUIZ #3 Form B SECTIONS (3.1, 3.2, 3.3) FALL 2007

NAME Solution

SCORE: / 20

*** RETAIN ALL GRADED PAPERS FOR YOUR RECORDS ***

1) Solve the following algebraically (2 Points Each)
(please give your answers in interval notation)

a) $10 \left(\frac{3-5x}{2} \leq \frac{1}{5}x+3 \right) 10$

$$\begin{aligned} 15 - 25x &\leq 2x + 30 \\ -2x &\quad -2x \\ -27x &\leq 15 \end{aligned}$$

$$x \geq \frac{15}{-27}$$

$$\boxed{\left[-\frac{15}{27}, \infty\right)} \text{ OR } \boxed{\left[-\frac{5}{9}, \infty\right)}$$

c) $3.5(3-2x) \leq -2.9x$

$$10.5 - 7x \leq -2.9x$$

$$-4.1x \leq -10.5$$

$$x \geq 2.56098$$

$$\boxed{\left[2.56098, \infty\right)}$$

2) Solve the following equations:

a. $12 \left(\frac{3x}{4} - \frac{2x}{3} = \frac{1}{6} \right) 12$

$$9x - 8x = 2$$

$$\boxed{x=2}$$

b) $6 \left(-\frac{5}{3}x + \frac{1}{2} \leq 2 \right) 6$

$$\begin{aligned} -10x + 3 &\leq 12 \\ -3 &\quad -3 \end{aligned}$$

$$-10x \leq 9$$

$$x \geq -\frac{9}{10}$$

$$\boxed{\left[-\frac{9}{10}, \infty\right)}$$

d) $9 \left(-\frac{5}{9}x + \frac{1}{3} \leq 2 \right) 9$

$$-5x + 3 \leq 18$$

$$-5x \leq 15$$

$$\boxed{x \geq -3}$$

$$\boxed{\left[-3, \infty\right)}$$

b. $\frac{3x+1}{5} = \frac{2x-1}{5}$

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

$$3x - 2x = -2$$

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

2) In 1992 a bus company had 30 busses; in 1995 the company had 345 busses. Let $f(x)$ represents the number of busses. Assume $f(x)$ is a linear function. (2 Points Each)

a. Find the slope of $f(x)$, and state what the slope represents in terms of the story?

$$\begin{cases} (1992, 30) \\ (1995, 345) \end{cases}$$

$$m = \frac{345 - 30}{1995 - 1992} = \frac{315}{3} = 105$$

Each year the number of Busses increases by 105.

b. Use your slope and one ordered pair to write the equation for $f(x)$.

$$30 = 105(1992) + b \Rightarrow b = -209130$$

$$f(x) = 105x - 209130$$

c. Predict the number of busses in the year 2007.

$$y = 105(2007) - 209130 = 1605$$

d. Determine the year when number of busses will be 1920.

$$1920 = 105x - 209130$$

$$x = 2010$$