

MONTGOMERY COLLEGE  
Department of Mathematics  
Rockville Campus

MA 103 KATIRAI QUIZ #3 Form B SECTIONS (2.4, 3.1, 3.2) FALL 2006

NAME Solution to Quiz 3 B SCORE:      / 20

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

1. Find the slope - intercept form of a line parallel to  $3y+2x=1$ , passing through  $(-4, 3)$

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

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

$$y = mx + b$$

$$3 = -\frac{2}{3}(-4) + b$$

$$3 = \frac{8}{3} + b$$

$$m = -\frac{2}{3}$$

$$\frac{1}{3} = b$$

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

2. Find the slope - intercept form of a line perpendicular to  $y = \frac{-1}{2}x + 1$ , passing through  $(-3, -4)$

$$m_{\perp} = 2$$

$$y = mx + b$$
$$-4 = 2(-3) + b$$

$$-4 = -6 + b$$

$$2 = b$$

$$y = 2x + 2$$

3. In 1998 Toyota sold 1.4 million vehicles. This number increased to 1.8 million in 2002.

a) Find a linear function that models the data.

$$\begin{matrix} (1998, 1.4) \\ (2002, 1.8) \end{matrix} \quad m = \frac{0.4}{4} = 0.1$$

$$y = mx + b$$

$$1.4 = 0.1(1998) + b \Rightarrow b = -198.4$$

$$y = f(x) = 0.1x - 198.4$$

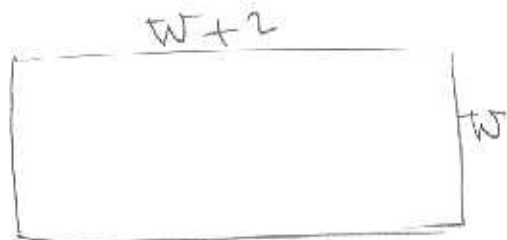
b) Determine the year when Toyota sold 1.7 million vehicles by solving a linear equation.

$$\begin{array}{r} 1.7 = 0.1x - 198.4 \\ +198.4 \quad \quad +198.4 \\ \hline 200.1 = 0.1x \end{array} \Rightarrow x = \frac{200.1}{0.1} = 2001$$

c) Predict the year when Toyota may sell 2 million vehicles.

$$\begin{array}{r} 2 = 0.1x - 198.4 \\ +198.4 \quad \quad +198.4 \\ \hline 200.4 = 0.1x \end{array} \Rightarrow x = \frac{200.4}{0.1} = 2004$$

4. The length of a rectangular room is 2 feet more than its width. If the perimeter of the room is 80 feet, find the width and length of the room.



$$P = 2L + 2W$$

$$80 = 2(W+2) + 2W$$

$$80 = 2W + 4 + 2W$$

$$80 = 4W + 4$$

$$\begin{array}{r} -4 \quad \quad -4 \\ \hline 76 = 4W \end{array}$$

$$\Rightarrow W = 19 \text{ feet}$$

$$L = 21 \text{ feet}$$

5. Solve the following equations:

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

$$3(3x) - 4(2x) = 2$$

$$9x - 8x = 2$$

$$x = 2$$

b.  $\frac{3x+1}{4} = \frac{2x-1}{3}$

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

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

$$9x+3 = 8x-4$$

$$x = -7$$