Math 115 Carter Sample Test 1 Fall 2004

Notes: This sample test was obtained from the sample test from Spring 2004 by editing with consideration of those topics that were covered in class. Compare the Spring's test to the Springs sample test. Work problems on all three documents, and you will be prepared for the test on Tuesday.

1. Give the equations and sketch the graph of the following lines:

   (a) The line that passes through the points $(300, 0)$ and $(0, 400)$;

   (b) The line that passes through the points $(2, 6)$ and $(4, 8)$;

   (c) The line that is perpendular to the line $y = 20x + 3$ and passes through the point $(0, 12)$.

   (d) The line that expresses the temperature in Celcius as a function of the Farenheit temperature. Note: $32°F = 0°C$ and $212°F = 100°C$.

   (e) The line that expresses cost as a function of mileage for one day when a rental car costs 25$ per day; and $0.42 per mile.

2. Given the functions $y = f(x)$ and $y = g(x)$ as indicated below determine the quantities $f(g(x))$ and $g(f(x))$. INDICATE CLEARLY WHICH IS WHICH:

   (a) $f(x) = \frac{x-2}{x+1}$; $\quad g(x) = \frac{y+2}{1-x}$.

   (b) $f(x) = 3x - 4$; $\quad g(x) = \sqrt{x}$.

   (c) $f(x) = 2x + 5$; $\quad g(x) = x^2$.

3. Compute the difference quotient $\frac{f(x+h)-f(x)}{h}$ for the functions:

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

   (b) $f(x) = x^2$

   (c) $f(x) = \frac{1}{x}$

   (d) $f(x) = x^3$

   (e) $f(x) = \frac{x-2}{x+1}$

4. Sketch the graph of each of the following functions:

(a) $f(x) = 12x - 0.01$

(b) $f(x) = 25x^2 - 0.1x + 12$

(c) $f(x) = 3|x + 5| - 27$

(d) $f(x) = \frac{1}{x-6} + 4$

5. Determine the maximum value for the product $A = xy$ when $3x + 4y = 5$.

6. An open box with square base is to be made from a square piece of paper that is 12 inches by 12 inches. For square corners are cut from the box and the rectangular sides are folded up. Determine the volume of the largest such box that can be made. (Hint: use your graphing calculator.)