Math 115 Carter Test 1 Fall 2004

General Instructions. Write your name on ONLY the outside of your blue book. When you finish your exam put this sheet inside your blue book and hand it in to either Sam Napier or to Dr. Carter. Do not write on this sheet! Give complete solutions to the following problems. Write neatly and indicate your answers clearly.

1. Give the equations and sketch the graph of the following lines ?*(5 points each):*

   (a) The line that passes through the points $(3000, 0)$ and $(0, 4000)$;

   (b) The line that passes through the points $(-2, 4)$ and $(10, 25)$;

   (c) The line that is perpendular to the line $y = 30x - 3$ and passes through the point $(0, 12)$.

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

   (e) The line with slope $M = 4$ and y-intercept $(0, 10)$.

2. Compute the difference quotient $\frac{f(x+h)-f(x)}{h}$ for the function $f(x) = \frac{1}{x+1}$. *(10 points)*

3. Compute $f(g(x))$ and $g(f(x))$ for the function $y = f(x)$ and $y = g(x)$ that appears below. BE SURE TO LET ME KNOW WHICH IS WHICH! *(5 points each)*

   (a) $f(x) = x^2; \quad g(x) = 2x - 3$

   (b) $f(x) = \sqrt{x}; \quad g(x) = x + 4$

   (c) $f(x) = \frac{1}{x} - 2; \quad g(x) = x - 3$

4. Sketch the graph of each of the following functions *(10 points each)*:

   (a) $f(x) = 12x - 5$

   (b) $f(x) = 5x^2 - 100x - 219$

   (c) $f(x) = \frac{1}{3}|x - 5| - 20$

   (d) $f(x) = \frac{1}{x-10} - 40$

5. Determine the maximum value for the product $A = xy$ when $x + 2y = 50000$ *(10 points).*