Honors Calc. I. Homework Set #4 Due 9/27/07 Name:_____

1. §3.3, p.146, #64 : Find $h'(2)$ given $f(2) = -3$, $g(2) = 4$, $f'(2) = -2$ and $g'(2) = 7$, where

   a) $h(x) = 5f(x) - 4g(x)$
   b) $h(x) = f(x)g(x)$
   c) $h(x) = \frac{f(x)}{g(x)}$
   d) $h(x) = \frac{g(x)}{1+f(x)}$

2. §3.3, p.147, #96: Let $f(x) = \begin{cases} x^2 & \text{if } x \leq 2 \\ mx + b & \text{if } x > 2. \end{cases}$ Find m and b that make f differentiable everywhere.

3. §3.4, p. 154, #30: Given $f(x) = \sec x$, find $f''(\frac{\pi}{4})$.

4. §3.4, p.154, #34: Find the points on the curve $y = \cos(x)/(2 + \sin x)$ at which the tangent is horizontal.

5. §3.4, p. 155, #40: Find $\lim_{x \to 0} \dfrac{\sin 4x}{\sin 6x}$.