Homework 3
Due Friday 2/28/2011 in class

Name: **Section Number:**

This cover sheet must be attached as the top page of your homework.

1. Show using the limit definition of the derivative that $\frac{d}{dx}(\sin x) = \cos x$
2. For $g(\alpha) = \sec(\alpha)$, find $g'(\alpha)$ and $g''(\alpha)$.
3. Find the coordinates (x, y) of the point where the grap of the following function

$$f(x) = \frac{\ln(\sqrt{x})}{x^2}$$

   has a horizontal tangent line.

4. Use implicit differentiation to find the second derivative $y''(x)$ given $7x + 5y^2 + 1$, where y is a function of x.
5. Use logarithmic differentiation to find the derivative y' of

$$y = \frac{e^{2x}}{(x^2-3)^2 \ln(\sqrt{x})}.$$