Exam #2

Math 121-D

Friday, October 10, 2003

For full credit show all work. When in doubt, explain your reasoning. Round your answers to at least three digits after the decimal point. Sketch any graph that you use. You may answer the questions in any order.

1. Find all discontinuities for the following function, and determine for each discontinuity if there is a vertical asymptote.

$$y = \frac{\sin x}{x^2 - 3x}$$

2. Find an equation for the tangent line to the curve $y = \sin(\cos x)$ at the point where $x = \pi/2$.

3. Find y' where $y = \sqrt{1 + \tan x}$.

4. Use the definition of the derivative (as a limit of $\Delta y/\Delta x$ as $\Delta x \to 0$) to find y' where $y = 2x^2 + 1$.

5. Use the derivative to find where the following function has horizontal slope.

$$y = \frac{x^2 + 2}{x^2 + 4}$$