

NAME _____ ID _____

MATHEMATICS 249

MIDTERM

Fall 2003

SHOW ALL WORK. Marks for each problem are to the left of the problem number.
NO CALCULATORS PLEASE.

[5] 1. Find $\lim_{x \rightarrow -1} \left(\frac{\sqrt{1-3x} - 2}{x+1} \right)$.

[4] 2. Find $\lim_{x \rightarrow 0^+} \left(\frac{\sin 5x}{x\sqrt{x}} \right)$.

[5] 3. Find $\frac{dy}{dx}$ where $y = x^3 \cos(1 - 4x)$.

[5] 4. Find $\frac{d}{dx} \left(\sqrt{4 - \sec(4/x)} \right)$.

[5] 5. Find $\frac{d}{dx} \left(\frac{e^{2x}}{x^2 + \ln(x^2)} \right)$.

[5] 6. Use implicit differentiation to find $\frac{dy}{dx}$ where $x^{3/2} + y^{3/2} = xy + 3$.

[5] 7. USE THE DEFINITION OF DERIVATIVE to find $\frac{d}{dx}(3 - 2x)$.

[6] 8. Find the equation of the tangent line to the curve $y = \frac{x^3}{3x^2 - 5}$ at the point on the curve where $x = 1$.