Test Total

Name _____

Test 1 Calculus II 3450:222 Dr. Norfolk Feb. 10th, 2006
INSTRUCTIONS : Show all of your work.

1. Evaluate *and simplify* the derivatives of the following functions of x.

(a) (7 pts) $f(x) = (3x^2 - 1)4^x$

(b) (7 pts) $g(x) = \ln \sqrt{e^{x^2}}$

(c) (7 pts) $h(x) = x^2 \tan^{-1} x$

(d) (7 pts) $j(x) = e^{-4x} \sin(3x)$

(e) (7 pts) $k(x) = \log_3(1 + e^x)$

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2. Evaluate and simplify the following integrals :

(a) (8 pts) $\int x \ln x \, dx$

(b) (8 pts) $\int_1^{\sqrt{e}} \frac{dx}{x\sqrt{1-(\ln x)^2}}$

(c) (8 pts) $\int \frac{t-3}{t^2+16} \, dt$

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(d) (8 pts) $\int (1+\tan^2 x)e^{\tan x}\,dx$

3. Use l'Hopital's Rule to evaluate :

(a) (7 pts) $\lim_{x\to 0}\left(\frac{1}{x}-\frac{1}{\sin x}\right)$

(b) (6 pts) $\lim_{x\to \frac{\pi}{2}^-}(1+4\cot x)^{\tan x}$

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