

## Test II

March 18, 2003

Math 251H

Name \_\_\_\_\_

1. Differentiate. (6 points @)

(a)  $f(x) = 3^{\sin^{-1}(\sqrt{x})}$

(b)  $g(x) = \log_5[\tan^{-1}(x)]$

(c)  $f(x) = \cot^{-1}(\sqrt{x^2 + 1})$

(d)  $g(x) = \sec^{-1}(3 \ln x)$

(e)  $f(x) = \cos^{-1}[\sin^{-1}(e^x + 4)]$

2. Integrate. (9 points @)

$$(a) \int \frac{dx}{\sqrt{3-8x^2}} =$$

$$(b) \int \frac{3ydy}{4+y^4} =$$

$$(c) \int \frac{5 \ln x}{x + x(\ln x)^2} dx =$$

$$(d) \int \frac{\sin^{-1}(x)}{\sqrt{9-9x^2}} dx =$$

$$(e) \int \frac{3^{\sec^{-1}(x)}}{x\sqrt{x^2-1}} dx = \quad (x > 5)$$

$$(f) \int_2^4 \frac{2}{x\sqrt{x^4-1}} dx =$$

3. Solve the Separable Equation. (8 points @)

$$(a) \frac{dy}{dx} - \frac{2x + 4xy - 3 - 6y}{x - xy + 2 - 2y} = 0$$

$$(b) (\sin x) y' - \frac{e^{3y^2}}{y} = 0$$