

MATH 152
Mrs. Bonny Tighe

EXAM I
7.1-8.3
100 points

NAME _____

SECTION _____ Wed 3/1/06

There are 11 problems with 10 points each

1. Find $f'(x)$: a) $f(x) = \ln \sqrt{\frac{x^3 - 1}{\tan x}}$

b) $f(x) = (3 - e^{\sqrt{x}})^4 (3^x + 5^x)$

2. Find the equation of the tangent line to the curve $y = \frac{\sin^{-1} x}{x^2}$ at the point $(1, \pi/2)$.

3. Evaluate: a) $\int_0^1 x e^{-x^2} dx =$ _____

b) $\int \frac{2-x}{3-x^2} dx =$ _____

4. Find dy/dx : $\ln xy = 2 - e^{xy}$

5. Integrate using trigonometric substitution: $\int \frac{\sqrt{9-x^2}}{x} dx$

6. Find the numerical value of each expression.

a) $\cosh^{-1}(0) =$ _____ b) $\cosh(\ln 2) =$ _____ c) $\log_2 8\sqrt{2} =$ _____

d) $e^{(\ln 5 - 2 \ln 2)} =$ _____ e) $\tan(\arcsin(0.3)) =$ _____

7. Evaluate using integration by parts:

a) $\int \tan^{-1} t \, dt = \underline{\hspace{2cm}}$

b) $\int_0^1 e^{2x} \cos 3x \, dx = \underline{\hspace{2cm}}$

8. Find the following limits. Use L'Hospital's Rule where appropriate.

a) $\lim_{x \rightarrow 0^+} x^2 \ln x = \underline{\hspace{2cm}}$

b) $\lim_{x \rightarrow \infty} \left(\frac{x-2}{2x+1} \right)^x = \underline{\hspace{2cm}}$

9. Use logarithmic differentiation to find the derivative for $f(x) = \left(\frac{x+2}{x-3} \right)^x$

10. Evaluate the integral.

$$\int_0^{\pi/3} \tan^5 x \sec^4 x \, dx$$

11. Evaluate: a) $\int \sin^3 x \cos^2 x \, dx = \underline{\hspace{2cm}}$

b) $\int \frac{\sec^2(\ln x)}{x} dx = \underline{\hspace{2cm}}$