

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)  $\int_0^1 x e^{-x^2} dx = \underline{\hspace{2cm}}$

SECTION 100 MATH 125

IMAX

6-15

100 points

MATH 125  
Mike Flynn Test

Topic 11: Improper Integrals

$$\int_{-\infty}^{\infty} f(x) dx = \lim_{a \rightarrow -\infty} \int_a^b f(x) dx + \lim_{b \rightarrow \infty} \int_a^b f(x) dx$$

b)  $\int \frac{2-x}{3-x^2} dx = \underline{\hspace{2cm}}$

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

( $x, y$ ) lying off the  $\frac{x+1}{x-1} = 0$  curve off the origin off the line  $x=1$

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

6. Find the numerical value of each expression.

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

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

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