

MATH 152
Mrs. Bonny Tighe

EXAM I
7.1-8.2
100 points

NAME _____

SECTION _____ Wed 9/28/05

There are 11 problems with 10 points each

1. Find $f'(x)$: $f(x) = \ln \sqrt{\frac{2x-1}{\sin x}}$

2. Find the equation of the tangent line to the curve $y = (\tan^{-1} x)(5^{x^3})$ at the point $(1, 5\pi/4)$.

3. Find dy/dx : a) $y = \ln(\ln(\sec x))$

b) $\tan^3(xy) = 2e^y$

4. Evaluate: a) $\int_0^1 x^2 e^{-x^3} dx = \underline{\hspace{2cm}}$

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

5. Evaluate: $\int \frac{1+x}{4-x^2} dx = \underline{\hspace{2cm}}$

6. Evaluate using integration by parts:

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

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

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

a) $\lim_{x \rightarrow 0} \left(\frac{1 - \cos x}{x^2 + x} \right) = \underline{\hspace{2cm}}$

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

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

8. Find the numerical value of each expression.

a) $\sinh^{-1}(1) = \underline{\hspace{2cm}}$ b) $\cosh(\ln 3) = \underline{\hspace{2cm}}$ c) $\log_2 4\sqrt{2} = \underline{\hspace{2cm}}$

d) $e^{(\ln 3 + 2 \ln 2)} = \underline{\hspace{2cm}}$ e) $\tan(\arcsin(0.1)) = \underline{\hspace{2cm}}$

9. Evaluate: a) $\int \frac{\sec^2 x}{1 - \tanh x} dx = \underline{\hspace{2cm}}$

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

10. Use logarithmic differentiation to find the derivative for each of the following:

a) $f(x) = \left(\frac{x+2}{\cos x} \right)^4$

b) $y = (\tan x + 2)^{\sqrt{x}}$

11. Evaluate the integral.

$$\int_0^{\frac{\pi}{6}} \cos^3 2x \sqrt{\sin 2x} \, dx$$