

MATH 152
Mrs. Bonny Tighe

EXAM IA
7.1-8.2
100 points

NAME _____

SECTION _____ Wed 9/28/05

There are 11 problems with 10 points each

1. Find the numerical value of each expression.

a) $\cosh^{-1}(1) =$ _____ b) $\sinh(\ln 3) =$ _____ c) $\log_3 27\sqrt{3} =$ _____

d) $e^{(2\ln 3 + \ln 2)} =$ _____ e) $\sin(\arctan(0.1)) =$ _____

2. Find dy/dx : a) $y = \ln(\ln(\csc x))$

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

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

4. Evaluate: a) $\int_1^4 \frac{2^{\sqrt{x}}}{\sqrt{x}} dx = \underline{\hspace{2cm}}$

b) $\int \frac{1}{x \ln x} dx = \underline{\hspace{2cm}}$

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

6. Evaluate using integration by parts:

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

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

7. Evaluate: $\int \frac{1-x}{9+x^2} dx = \underline{\hspace{2cm}}$

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

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

9. Evaluate the integral.

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

10. Evaluate: a) $\int \frac{\csc h^2 x}{1 - \coth x} dx = \underline{\hspace{2cm}}$

b) $\int e^{x^2} \cos(e^{x^2}) 2x dx = \underline{\hspace{2cm}}$

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

a) $f(x) = \sqrt{3e^x + 2} (\sqrt{x} - \cos x)^5$

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