

Test Total

Name _____

Final Exam Calculus II 3450:222 Dr. Norfolk Monday, May 5th, 2003

Show all of your work.

1. Let $f(x) = xe^x$. Find the equation of the tangent line to the curve $y = f^{-1}(x)$ when $x = e$.

10 points

2. Find the absolute maximum and absolute minimum (if possible) for $g(x) = \frac{\ln x}{x}$, on the interval $x > 0$.

10 points

3. Find the derivative of $h(x) = x^{\ln x}$

10 points

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4. Evaluate $\int \frac{dx}{x^2 + 6x + 15}$

10 points

5. Evaluate $\lim_{x \rightarrow 0} \frac{\sin x - x}{x^3}$

10 points

6. Evaluate $\int x e^{-3x} dx$

10 points

7. What is the transformation needed to convert $\int \frac{5}{\sqrt{x^2 + 4x}} dx$ to a simplified trigonometric integral? DO NOT DO THE SUBSTITUTION.

10 points

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8. Evaluate $\int \sin^7 \theta \cos^3 \theta d\theta$

10 points

9. Evaluate and simplify $\int \frac{dx}{x^3 + 2x^2}$

10 points

10. Evaluate the *improper* integral $\int_0^{\pi/4} \frac{\sec^2 x}{\sqrt{1 - \tan^2 x}} dx$.

10 points

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