

Name: _____

TA: _____

Math 222

Prof. Beck

First Exam

Fall 2004

1. Integrate

$$\int \frac{\sec^3 x + e^{\sin x}}{\sec x} dx$$

2. Integrate

$$\int \sin^4 3t \cos^4 3t dt$$

3. Use the method of completing the square, along with a trigonometric substitution if needed, to evaluate each integral.

$$\int \frac{2x + 1}{x^2 + 2x + 2} dx$$

4. Use integration by parts to evaluate

$$\int_{\pi/6}^{\pi/4} x \sec^2 x \, dx$$

5. Evaluate

$$\int \frac{w}{\sqrt{w+5}} dw$$

6. Evaluate this improper integral or show that it diverges.

$$\int_{-\infty}^{\infty} \frac{1}{x^2 + 2x + 10} dx$$

7. Use the method of partial fraction decomposition to perform this integration.

$$\int \frac{1}{(x-1)^2(x+4)^2} dx$$

8. Indicate whether the given series converges or diverges. If it converges, find its sum. Hint: It may help you to write out the first few terms of the series.

$$\sum_{k=2}^{\infty} \left(\frac{1}{k} - \frac{1}{k-1} \right)$$