Name: _____

TA: _____

Math 222 Prof. Beck

First Exam Fall 2004

1. Integrate

$$\int e^x \sec e^x \, dx$$

2. Integrate

$$\int \cos^3 3\theta \sin^{-2} 3\theta \, d\theta$$

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

$$\int \frac{dx}{\sqrt{4x - x^2}}$$

4. Use integration by parts to evaluate

$$\int \frac{z^7}{(4-z^4)^2}\,dz$$

5. Evaluate

$$\int \frac{e^{4x}}{1 + e^{8x}}\, dx$$

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

$$\int_{-\infty}^{\infty} \frac{x}{\sqrt{x^2+9}}\,dx$$

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

$$\int \frac{2x^2 - 3x - 36}{(2x - 1)(x^2 + 9)}\, dx$$

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.

$$\sum_{k=2}^{\infty}\left(\frac{3}{(k-1)^2}-\frac{3}{k^2}\right)$$