

Name: \_\_\_\_\_

TA: \_\_\_\_\_

Math 222

Prof. Beck

First Exam

Fall 2005

1. Integrate:

$$\int \frac{t^2 \cos^2(t^3 - 2)}{\sin^2(t^3 - 2)} dt$$

2. Integrate:

$$\int \sin^5 4x \cos^2 4x \, dx$$

3. Integrate:

$$\int \sqrt{5 - 4x - x^2} dx$$

4. Evaluate:

$$\int \frac{t^7}{(7 - 3t^4)^{3/2}} dt$$

5. Integrate:

$$\int e^{4x} \cos 2x \, dx$$

6. Integrate:

$$\int \frac{x^3}{x^2 + x - 2} dx$$

7. Evaluate:

$$\int_e^{\infty} \frac{1}{x \ln x} dx$$

8. Evaluate:

$$\int_0^3 \frac{dx}{x^3 - x^2 - x + 1}$$

9. Prove that  $\lim_{n \rightarrow \infty} x_n = a$  if and only if  $\lim_{n \rightarrow \infty} |x_n - a| = 0$ .

10. Prove that a bounded increasing sequence is convergent.