

Name: _____

TA: _____

Math 222

Prof. Beck

First Exam

Fall 2005

1. Integrate:

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

2. Integrate:

$$\int \sin 4y \cos 5y \, dy$$

3. Integrate:

$$\int \frac{3x}{\sqrt{x^2 + 2x + 5}} dx$$

4. Evaluate:

$$\int x^5 \sqrt{x^3 + 4} dx$$

5. Integrate:

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

6. Integrate:

$$\int \frac{6x^2 + 22x - 23}{(2x - 1)(x^2 + x - 6)} dx$$

7. Evaluate:

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

8. Evaluate:

$$\int_{-2}^{-1} \frac{dx}{(x+1)^{4/3}}$$

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.