

Calculus 2
Unit 2 Exam - Spring 2008

Name: _____

Answer all of the following questions. Show all your work. Answers alone are not considered to be a complete solution. All work must be in an organized logical format. Simplify your answers, when possible. Where appropriate, **draw a box** around your final answers.

1. (15 points) **Basic Integrals**

Evaluate the integral: $\int \frac{1 + \cos x}{\sin x} dx$.

2. (15 pts.) **Trigonometric Integrals**

Evaluate the integral: $\int \sin^5 t dt$.

3. (14 pts.) **Integration by Parts**

Evaluate the integral: $\int x \ln x \, dx$.

4. (14 pts.) **L'Hôpital's Rule**

Find the limit: $\lim_{x \rightarrow \infty} x^{1/x}$.

5. (14 pts.) **Partial Fractions**

Evaluate the integral: $\int \frac{5x^2 - 12x - 28}{(x - 2)(x^2 - 4)} dx$.

6. (14 pts.) **Trigonometric Substitution**

Evaluate the integral: $\int \frac{x^2}{(x^2 + 1)^2} dx$.

7. (14 pts.) **Improper Integrals**

Evaluate the integral: $\int_0^{\infty} x e^{-x} dx$.