

Calculus II - Exam 2 - Fall 2006

October 26, 2006

Name:

Honor Code Statement:

Directions: There are 13 problems. Do any **11** of these problems. **Justify** all answers/solutions. Calculators are not permitted. You may use the table of trigonometric identities given on the last page. Evaluate each given integral.

1. $\int \sin(y)e^{\cos(y)} dy$

2. $\int \frac{4x^3 - x^2 + 16x}{x^2 + 4} dx$

3. $\int_0^{\pi/4} \sqrt{1 - \frac{2 \tan(x)}{\tan(2x)}} dx$ (Hint: Use a trigonometric identity.)

4. $\int 2y \sec^2(y) dy$

5. $\int e^\theta \sin(\theta) d\theta$

6. $\int \frac{x+3}{2x(x-2)(x+2)} dx$ (Hint: use partial fraction decomposition.)

7. $\int_{-\pi}^{\pi} \sin(3x) \sin(3x) dx$

8. $\int 4 \tan^3(\theta) d\theta$

9. $\int \frac{3}{\sqrt{t^2-9}} dt$

10. $\int \frac{4y^2}{(1-y^2)^{3/2}} dy$

Determine if the following integrals converge or diverge.

11. $\int_0^1 \frac{1}{(1+x)\sqrt{x}} dx$ (Hint: Let $u = \sqrt{x}$.)

12. $\int_2^\infty \frac{1}{x^{1.001}} dx$

13. $\int_0^1 (x \ln x) dx$