

Test 2a

Math 175, Calculus II, Spring 2012

Section: 01

Name: _____

This test is closed book and closed notes. Calculators of any kind are **not** allowed. You must clearly show your work to receive credit. Unless otherwise stated, you do not need to simplify your answer.

1. Find $\int \sin^2 x \cos^3 x \, dx$. (11 points)

2. Find $\int \tan^3 x \sec^5 x \, dx$. (11 points)

3. Find $\int \frac{1}{\sqrt{9+x^2}} dx$. (11 points)

4. Find $\int \frac{1}{x(x-1)^2} dx$. (11 points)

5. Find $\int \frac{x-1}{x+1} dx$. (11 points)

6. Use Simpson's rule to estimate $\int_0^4 \sin(\pi x) dx$ using $n = 4$ subintervals. (11 points)

7. Determine whether $\int_8^\infty \frac{1}{(x+1)^{3/2}} dx$ diverges or converges. If it converges, find the value of the integral. (11 points)

8. Solve the differential equation $y' = \cos^2 y$ subject to the initial condition $y(0) = \pi/4$. (11 points)

9. Find a **recurrence relation** for the sequence $\{a_n\}_{n=0}^{\infty} = \{1, 2, 4, 8, 16, \dots\}$. (11 points)