

# Calculus II, Exam II, Spring 2009

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

Student signature: \_\_\_\_\_

Show all your work and give reasons for your answers. Good luck!

## Part I

Each problem in part I is worth 6 points; Show your work!!

Evaluate the following integrals

(1)  $\int_0^1 \sqrt{x}(x^{10} + 1) dx$

(2)  $\int x^3 \sin(x^4 + 5) dx$

$$(3) \int_0^\pi \cos^2(x) \, dx$$

$$(4) \int x e^x \, dx$$

$$(5) \int \frac{x^5 + \sqrt[3]{x}}{x} \, dx$$

(6)  $\int \ln(x) \, dx$

(7) If  $F(x) = \int_1^x \sin(t^5 + t) \, dt$ , find  $F'(x)$

(8) Set up a Riemann sum with 3 terms, using the midpoint rule,  
for  $\int_1^4 \frac{1}{x} \, dx$

**Part II**

Each problem in part II is worth 13 points. Justify all your work for full credit!!

Evaluate the following integrals.

9.  $\int \cos^3(x) \sin^8(x) dx$

10.  $\int e^x \sin(x) dx$

11.  $\int_0^1 \frac{x}{x^2+x-12} dx$

12.  $\int \frac{1}{x(x^2+4)} dx$