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

Part I All problems in part I are worth 9 points each.

1) Evaluate $\int \frac{x^4 + \sqrt{x}}{x} \, dx$.

2) Evaluate $\int x^2 \sin(3x^3 + 5) \, dx$.

3) Evaluate $\int_1^2 \ln(x) \, dx$. 
(4) Evaluate \( \int \frac{1}{x^2 - 1} \, dx \).

(5) Evaluate \( \int \sin^6(x) \cos^3(x) \, dx \).

(6) Evaluate \( \int x(2x + 1)^5 \, dx \).

(7) If \( F(x) = \int_1^x \sqrt{t^3 + t^2 + t + 1} \, dt \), find \( F'(x) \).
(8) Approximate $\int_1^2 e^x \, dx$ by a Riemann sum with $n=4$ terms and using the midpoint rule. Note: you do not need to compute and add the terms in the sum.

**Part II.** All problems in part II are worth 10 points.

(9) Evaluate $\int_1^x \frac{1}{x^3 + 2x^2 + x} \, dx$. 
(10) Evaluate $\int e^{\sqrt{x}} \, dx$.

(11) Evaluate $\int \sin^4(x) \, dx$. 
Calculus II, Exam I, Spring 2007

Name: _______________________

Student signature: _______________________

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

Part I All problems in part I are worth 9 points each.

1. Evaluate \( \int x(2x + 1)^{50} \, dx \).

2. Evaluate \( \int \frac{1}{x^2 - 1} \, dx \).

3. Approximate \( \int_1^2 e^x \, dx \) by a Riemann sum with \( n=4 \) terms and using the midpoint rule. Note: you do not need to compute and add the terms in the sum.
(4) If \( F(x) = \int_1^x \sqrt{t^3 + t^2 + t + 1} \, dt \), find \( F'(x) \).

(5) Evaluate \( \int \sin^6(x) \cos^3(x) \, dx \).

(6) Evaluate \( \int \frac{x^4 + \sqrt{x}}{x} \, dx \).

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