Your name: _____

Rec. Instr.: _____   Rec. Time: _____

Show all your work in the space provided under each question. Please write neatly and present your answers in an organized way. You may use your one sheet of notes, but no books or calculators. This exam is worth 60 points. The chart below indicates how many points each problem is worth.

Problem	1	2	3	4
Points	/14	/9	/9	/10
Problem	5	6		Total
Points	/9	/9		/60

1. Evaluate the integrals.

   (a)

   $$\int x^2 \cos(x^3) \, dx$$

   (b)

   $$\int x^2 \cos(x) \, dx$$

2. Use a substitution to evaluate the integral.

$$\int \frac{\sin^3(x)}{\cos^4(x)}\,dx$$

3. Use partial fractions to evaluate the integral.

$$\int \frac{x + 12}{x^3 + 3x^2} \, dx$$

4. Use a trigonometric substitution to evaluate the integral.

Hint: $2x - x^2 = 1 - (x-1)^2$.

$$\int \sqrt{2x - x^2} \, dx$$

5. Write the improper integral as a limit, and evaluate.

$$\int_0^1 \frac{x^4}{\sqrt[3]{1-x^5}} \, dx$$

6. Find the volume of revolution formed by revolving around the y-axis the region under the curve.

$y = \sqrt{x^2 + 1}$ for $0 \le x \le 1$.