KOÇ UNIVERSITY

MATH 106

SECOND MIDTERM DECEMBER 8, 2007

Duration of Exam: 120 minutes

INSTRUCTIONS: No calculators may be used on the test. No books, no notes, no questions, and talking allowed. You must always explain your answers and show your work to receive full credit. Use the back of these pages if necessary. Print (use CAPITAL LETTERS) and sign your name. GOOD LUCK!

SURNAME, Name: _____

Student ID no: _____

Signature: _____

(Check One):

(Barış Çoskunüzer – 11:30-13:20) : ___
(Barış Çoskunüzer – 14:30-16:20) : ___
(Burak Özbağcı – 14:30-16:20): ___
(Demircan Canadinç 14:30-16:20): ___
(Burak Özbağcı – 10:30-12:20): ___

PROBLEM	1	2	3	4	5	6	7	8	9	**Total**
POINTS	10	10	15	10	10	10	15	10	10	**100**
SCORE										

Problem 1 (10 pts) Find the area between the curves $y = x^2 - 5x - 2$ and $y = -x^2 + x + 6$.

Problem 2 (10 pts) Evaluate the definite integral.

$$\int_1^2 \frac{\sqrt{4-x^2}}{x}\, dx$$

Problem 3a (7 pts) Determine whether the following integral is convergent or divergent. Do not evaluate.

$$\int_1^\infty \frac{x^2 + x + 1}{x^4 + 1}\, dx$$

Problem 3b (8 pts) Evaluate the following integral.

$$\int_0^2 \frac{dx}{(x-2)^{\frac{2}{3}}}$$

Problem 4 (10 pts) Find the indefinite integral.

$$\int \arctan x \; dx$$

Problem 5 (10 pts) Find the indefinite integral.

$$\int \frac{x^5}{1+x^2}\, dx$$

Problem 6 (10 pts) Find the indefinite integral.

$$\int \frac{2}{x^4 + 2x^3}\, dx$$

Problem 7 (15 pts) Find the volume of the solids obtained by rotating the region between $y = \frac{x}{2}$ and $y = \sqrt{x}$ about the following axes.

a) x-axis.

b) y-axis.

Problem 8 (10 pts) Find the following limit.

$$\lim_{x \to 0^+} (1 + \frac{3}{x})^x$$

Problem 9 (10 pts) Find the following limit.

$$\lim_{x \to 1} \frac{\int_{3+x}^{4} t^{\frac{3}{2}} \, dt}{1 - e^{2x-2}}$$