Prince Sultan university
Department of Mathematics
Major II Exam
Semester II ,2007-2008 Spring(072)
26.04.2008
Math 113-Calculus II

Time Allowed: 90 minutes

Name:

ID Number:

Instructions:

1. Answer all the questions.
2. Show your work in the spaces provided for each question.

Question	Q.1	Q.2	Q.3	Q.4	Total
Grade					

Question 1.

a. (12 pts.) Find the area of the region enclosed by the curves $y = x^2$ and $y = 4x$ by integrating with respect to x.

b. (13 pts.) Find the volume of the solid that results when the region enclosed by $y = 9 - x^2, y = 0$ is revolved about the x-axis.

Question 2.

a. (12 pts.) Use cylindrical shells to find the volume of the solid generated when the region enclosed by $x = 2y, y = 2, y = 3, x = 0$ is revolved about x-axis.

b. (13 pts.) Find the exact arc length of the curve $x = \frac{1}{3}\left(y^2 + 2\right)^{3/2}$ from $y=0$ to $y=1$.

Question 3.

a. (12 pts.) Find the area of the surface generated by revolving the curve $x = 2\sqrt{1-y}$, $-1 \le y \le 0$.

b. (13 pts.) Find $\frac{dy}{dx}$ using logarithmic differentiation if $y = \sqrt[5]{\frac{x-1}{x+1}}$.

Question 4. Evaluate the integrals:

a. (5 pts.) $\int_0^{\ln 3} e^x \left(1+e^x\right)^{1/2} dx.$

b. (5 pts.) $\int \frac{t+1}{t} dt.$

c. (5 pts.) $\int \frac{3x}{1+x^2} dx$

d. (5 pts.) $\int \left[\frac{2}{x} + 3\sin x\right] dx$