MA 261 **EXAM 2** **SPRING 2008**

Name ______________________________

Student ID Number ______________________________

Lecture ______________________________

Recitation Instructor ______________________________

Instructions:

1. This exam contains 10 problems, each worth 10 points.
2. Please supply all information requested above on the mark-sense sheet.
3. Work only in the space provided, or on the backside of the pages. Mark your answers clearly on the scantron. Also, circle your choice for each problem in this booklet.
4. No books, notes or calculators.

1. Let $z = y/x^2 + e^{xy}$, $x = r\cos t$, $y = r\sin t$. Then $\partial z/\partial t$ at $r = 1$, $t = 0$ equals

A. 0

B. $\frac{1}{2}$

C. 2

D. 1

E. 3

2. Which of the statements below is true for

$$f(x,y) = x^3 + 3xy + y^3$$

at the point $(0,0)$:

A. $f(0,0)$ is a local maximum

B. $f(0,0)$ is a local minimum

C. $\nabla F(0,0) = \mathbf{i} + \mathbf{j}$

D. more info is needed

E. $(0,0)$ is a saddle point

3. Let z be implicitly defined by $ze^{xz} = 2z + y + 1$. Find z_x at the point $(0, 0, -1)$.

A. -2

B. -1

C. 0

D. 1

E. 2

4. The absolute maximum of $f(x, y) = 2xy$ on $x^2 + y^2/4 \leq 18$ is

A. 22

B. 36

C. 54

D. 18

E. 40

5. Parametric equations of the normal line to the surface

$$e^{x+z} = y + x$$

at the point $(1, 0, -1)$ are

A. $x = 1 + t,\ y = -t,\ z = -1 + t$

B. $x = 1,\ y = -t,\ z = -1 + t$

C. $x = 1 - t,\ y = t,\ z = -1 + t$

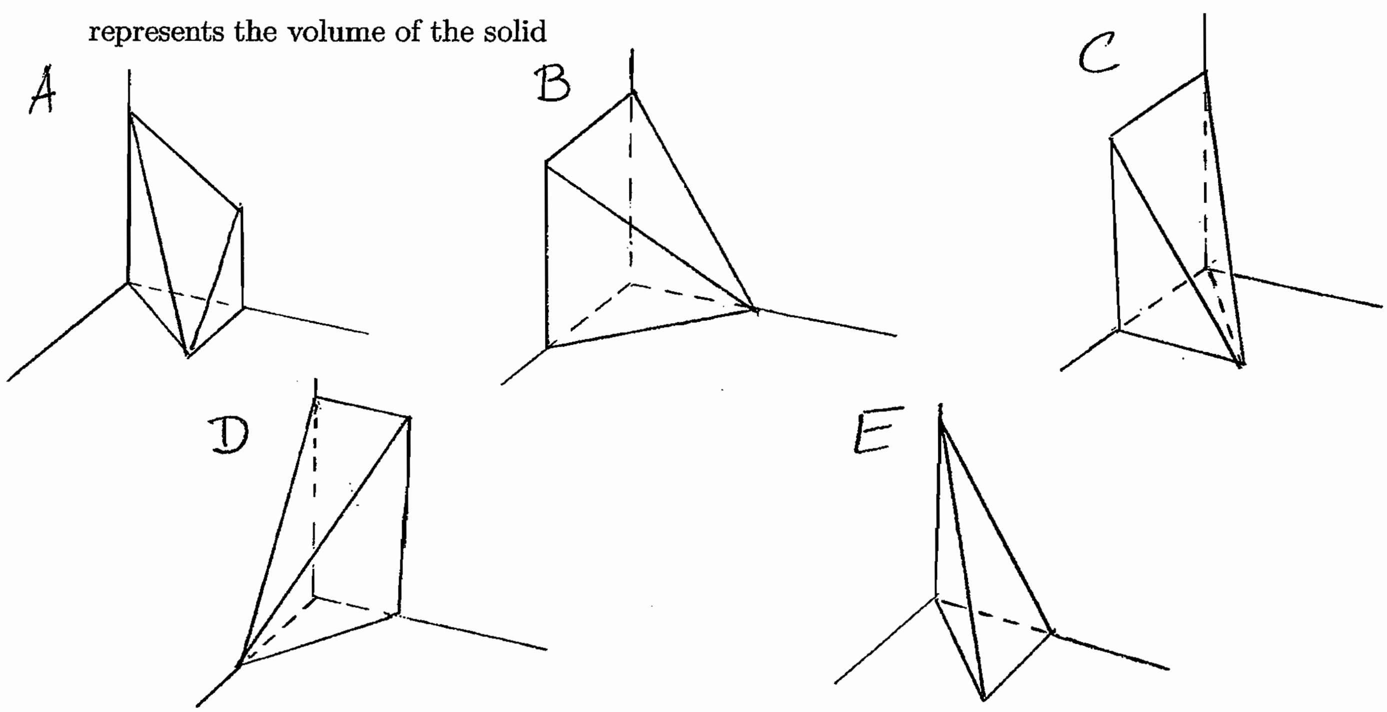
D. $x = t,\ y = -t,\ z = -1 + t$

E. $x = -t,\ y = 0,\ z = -1 + t$

6. The integral

$$\int_0^1 \int_x^1 (4 - 2x - 2y)\, dy\, dx$$

represents the volume of the solid



7. Change the order of integration in the following integral

$$\int_0^2 \int_{1-x/2}^{1-x^2/4} f(x,y)\,dy\,dx.$$

A. $\int_0^1 \int_0^{2-2y} f(x,y)\,dx\,dy$

B. $\int_0^2 \int_{1-y}^{\sqrt{1-y}} f(x,y)\,dx\,dy$

C. $\int_0^2 \int_{1-y/2}^{1-y^2/4} f(x,y)\,dx\,dy$

D. $\int_0^1 \int_{2-2y}^{2\sqrt{1-y}} f(x,y)\,dx\,dy$

E. $\int_{1-x/2}^{1-x^2/4} \int_0^2 f(x,y)\,dx\,dy$

8. Let D be the part of the disk centered at 0 with radius $\sqrt{2}$ that lies to the right of the line $x = 1$. Then the area of D is represented by the following integral

A. $\int_{-\pi/2}^{\pi/2} \int_{1/\cos\theta}^{\sqrt{2}} r\,dr\,d\theta$

B. $\int_{-\pi/4}^{\pi/4} \int_{1/\cos\theta}^{\sqrt{2}} r\,dr\,d\theta$

C. $\int_{-\pi/4}^{\pi/4} \int_1^{\sqrt{2}} r\,dr\,d\theta$

D. $\int_{-\pi/2}^{\pi/2} \int_{\cos\theta}^{\sqrt{2}} r\,dr\,d\theta$

E. $\int_{-\pi/4}^{\pi/4} \int_{\sqrt{2}/\cos\theta}^{1} r\,dr\,d\theta$