
KOÇ UNIVERSITY

MATH 200 - Multivariable Calculus and Matrix Algebra

Exam 2 May 11, 2009

Duration of Exam: 90 minutes

INSTRUCTIONS: Calculators are not allowed. No books, no notes, no questions and no 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**, and indicate your section below.

Surname, Name: _____

Signature: _____

Section (Check One):

Section 1: S. Küçükçifçi (Mon-Wed 11:00) _____

Section 2: S. Küçükçifçi (Mon-Wed 15:30) _____

PROBLEM	POINTS	SCORE
1	27	
2	25	
3	24	
4	24	
TOTAL	100	

1. (a) (9 points) Find an equation of the plane through $(1, 2, -2)$ that contains the line $x = 2t, y = 3 - t, z = 1 + 3t, t \in \mathbb{R}$.

(b) (9 points) Find an equation of the line through $(-1, -1, 0)$ that is perpendicular to the plane in part (a).

(c) (9 points) Find the point in which the line in (a) intersects the plane $2x - y + z = 2$.

2. Let $f(x, y) = \sqrt{y - x} \ln(y + x)$.

(a) (15 points) Find the domain and the range of f .

(b) (10 points) Find f_{xy} .

3. (a) (12 points) Find the following limit if it exists or show that the limit does not exist.

$$\lim_{(x,y) \rightarrow (0,0)} \frac{x^2 y e^y}{x^4 + 4y^2}$$

- (b) (12 points) Find $\vec{r}(t)$ if $\vec{r}'(t) = 2t \vec{i} + 3t^2 \vec{j} + \sqrt{t} \vec{k}$ and $\vec{r}(1) = \vec{i} + \vec{j}$.

4. (a) (12 points) Find an equation of the tangent plane to the surface $xy + yz + zx = 3$ at the point $(1, 1, 1)$.

(b) (12 points) Find $\partial z / \partial x$, where $yz = \ln(x + z)$.