



ÇANKAYA UNIVERSITY

Department of Mathematics and Computer Science

MCS 102 - Calculus for International Trade

SECOND MIDTERM EXAMINATION

STUDENT NUMBER:

NAME-SURNAME:

SIGNATURE:

INSTRUCTOR:

DURATION: 80 minutes

Question	Grade	Out of
1		45
2		20
3		20
4		20
Total		105

IMPORTANT NOTES:

- 1) Please make sure that you have written your student number and name above.
- 2) Check that the exam paper contains 4 problems.
- 3) Show all your work. No points will be given to correct answers without reasonable work.

1) For the following system

$$\begin{aligned}2x - y + 3z &= 4 \\x - y &= 0 \\-x + 2y + 2z &= 3\end{aligned}$$

a) Find the determinant of the coefficient matrix A by cofactor method.

b) Find $\text{Adj}(A)$.

c) Find A^{-1} by using the adjoint matrix.

d) By using A^{-1} , solve the system.

e) (BONUS) Find A^{-1} by reduction.

- 2) For the following system, determine the number of solutions by reduction method (no solution, unique solution or infinitely many solutions) and write parametric form if there are infinitely many solutions)

$$\begin{aligned}x - 3y + z &= 4 \\5x - y + 2z &= 10\end{aligned}$$

3) Using Cramer's Rule solve the following system.

$$2x + y + z = 5$$

$$x + 2y = 3$$

$$y + z = 2$$

4) a) Evaluate the partial derivatives of the following function

$$f(x, y) = \sqrt[4]{x^2 + x^3y^2} + xy$$

b) Production function is given by

$$P(x, y) = \frac{4x^3 + y^2}{x + y}.$$

Evaluate marginal functions for $x = 1$ and $y = 1$.