

Midterm Exam

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Exercise 1. (10 points) Use Cramers rule and row echelon form to solve the following system of equations::

$$\begin{cases} x - 2y + z = 7 \\ 3x - 5y + z = 14 \\ 2x - 2y - z = 3 \end{cases}$$

Exercise 2. (3 points) Find the domain of the following functions of two variables:

1) $f(x, y) = \log(x^2 - y^2)$

Exercise 3. (7 points) Expand the following functions of two variables up to the 2th order around the point x_0 :

1) $f(x, y) = (1 + x)^y, \quad x_0 = (1, 1)$

Exercise 4. (10 points) Find the maxima and minima of the following functions:

1) $f(x, y) = x^2 - y^2$

2) $f(x, y) = 2xy + 2x - x^2 - 2y^2$

Exercise 5. (3 bonus points) Clearly state the properties of the transpose matrix.