

First Midterm Exam

Sunday, Safar 02, 1439	PHYS 201	Academic year 1438-39 H
7:00 – 8:30 pm	Mathematical Physics I	First Semester

Student's Name		اسم الطالب
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Section No.		رقم الشعبة
Classroom No.		رقم قاعة الاختبار
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Roll Number		رقم التحضير

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Instructions:

- Switch off your mobile and place it under your seat.
- No calculator is allowed.

Problem 1 (3 Marks)

Find a system of linear equations corresponding to the given augmented matrix:

$$\begin{pmatrix} 3 & 0 & -2 & 4 \\ 7 & 1 & 4 & -1 \\ 0 & 2 & 0 & 5 \end{pmatrix}$$

Problem 2 (4 Marks)

Solve the linear system of equations by Gauss-Jordan elimination:

$$\begin{cases} x_1 + 2x_2 - 3x_3 = 6 \\ 2x_1 - x_2 + 4x_3 = 1 \\ x_1 - x_2 + x_3 = 3 \end{cases}$$

Problem 3 (4 Marks)

Solve the matrix equation:

$$\begin{pmatrix} a-b & b+a \\ 4d+c & 2d-2c \end{pmatrix} = \begin{pmatrix} 9 & 3 \\ 7 & 6 \end{pmatrix}$$

Problem 4 (4 Marks)

Let A be the matrix::

$$\begin{pmatrix} 3 & 0 & 0 \\ 0 & -1 & 3 \\ 0 & -3 & -1 \end{pmatrix}$$

Calculate A^2 .

Problem 5 (4 Marks)

Use the given information to find A:

$$(5A)^{-1} = \begin{pmatrix} 4 & 2 \\ 1 & 3 \end{pmatrix}$$

Problem 6 (3+3 Marks)

1- Compute the inverse of the matrix:

$$A = \begin{pmatrix} 3 & 4 \\ 2 & 3 \end{pmatrix}$$

2- Calculate:

$$\text{tr}(A^2 - 2A^T)$$