

淡江大學 105 學年度碩士班招生考試試題

36-1

系別：資訊工程學系
資訊工程學系資訊網路與多媒體碩士班

科目：線性代數

考試日期：3月5日(星期六) 第3節

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1. Find general solution of the following linear system. Write the solution in matrix form. (16 points)

$$\begin{cases} 4x_1 - 3x_3 + 2x_5 = 1 \\ 2x_2 + 3x_4 + 5x_5 = -2 \\ x_1 + 3x_2 - x_3 + 4x_4 = -3 \end{cases}$$

2. Let $A = \begin{bmatrix} -1 & 2 \\ 4 & -3 \end{bmatrix}$, Compute A^{9000} . (16 points)

3. Given 3 points in 3-space $P_1(-2, 3, 8)$, $P_2(3, -1, 9)$ and $P_3(1, -4, 7)$. Find the area of $\triangle P_1P_2P_3$ (16 points)

4. Find the determinant of matrix A, $A = \begin{bmatrix} 2 & -9 & -5 & -8 \\ 6 & -3 & 4 & 2 \\ 1 & -5 & -1 & -2 \\ 4 & 8 & 4 & 2 \end{bmatrix}$ (16 points)

5. $A = \begin{bmatrix} -2 & 3 & 1 \\ 5 & -2 & 7 \\ -3 & 2 & 4 \end{bmatrix}$, Find A^{-1} . (16 points)

6. Find eigenvalues and eigenvectors of matrix A if it exists, where $A = \begin{bmatrix} 2 & 4 & 3 \\ 0 & -3 & -2 \\ 0 & 0 & 1 \end{bmatrix}$

(20 points)