

1. 求 A 的特徵值與特徵向量。(25 分)

$$A = \begin{pmatrix} 2 & 1 & 0 \\ 1 & 2 & 1 \\ 0 & -1 & 2 \end{pmatrix}$$

2. 求 Laplace 轉換, $\mathcal{L}\left\{\frac{\sin kt}{t}\right\} = ?$ (25 分)

3. Find the value a so that the function $y = e^{ax}$ is a solution of the given differential equation. (15 分)

$$5y'' + 9y' - 2y = 0$$

4. Solve the following initial-value problem by use of Laplace transform. (20 分)

$$y'' + 3y' + 2y = 0, y(0) = 0, y'(0) = 1$$

5. Solve the given problem using Cramer's rule. (15 分)

$$x_1 + 2x_2 + x_3 = 8$$

$$2x_1 - 2x_2 + 2x_3 = 7$$

$$x_1 - 4x_2 + 3x_3 = 1$$