

國立嘉義大學九十二學年度轉學生招生考試試題

科目：工程數學

(請將答案寫在答案卷上)

1. Solve the initial value problem: $\frac{dy}{dx} = (-2x + y)^2 - 2$, $y(0) = 0$. (25%)

2. Solve the initial value problem: $\cos x(e^{2y} - y)\frac{dy}{dx} = e^y \sin 2x$, with $y(0) = 0$. (25%)

3. Given a matrix $A = \begin{bmatrix} 1 & 1 & -4 \\ 2 & 0 & -4 \\ -1 & 1 & -2 \end{bmatrix}$ and its eigenvalues -2, -1, and 2.

Find (a) the associated eigenvectors, (b) the inverse matrix A^{-1} . (25%)

4. Evaluate $\int_C (x^5 + 3y)dx + (2x - e^{y^3})dy$, where C is the circle

$$(x-1)^2 + (y-4)^2 = 9. \quad (25\%)$$