中國文化大學 106 學年度碩士班考試入學招生考試試題

系組：機械工程學系數位機電碩士班　　節次：第 2 節

科目：工程數學

1. Solve $y' = \frac{4y}{4x-y}$. (10%)

2. Solve $y'' + 4y' + 4y = 0$. (10%)

3. Solve $y'' + 9y = 0$. (10%)

4. Use two different methods to solve the ODE. (15%)

5. Find the Laurent's series of $f(z) = \frac{1}{z^2 - 3z + 2}$ in case of $1 < |z| < 2$. (15%)

6. Solve $y' = xe^{x-y}$ with the boundary condition: $y = \ln 2$ at $x = 0$. (20%)

7. Solve $\frac{d}{dt}\begin{bmatrix} x_1(t) \\ x_2(t) \end{bmatrix} = \begin{bmatrix} 3 & -2 \\ 2 & -2 \end{bmatrix}\begin{bmatrix} x_1(t) \\ x_2(t) \end{bmatrix}$. (20%)