

系級：\_\_\_\_\_ 學號：\_\_\_\_\_ 姓名：\_\_\_\_\_

1. 給微分方程  $x^2y'' - 4xy' - 6y = 0$  並給一補解  $y_1 = \frac{1}{x}$  試求另一補解  $y_2 = ?$

2. 試求下述微分方程的通解

(1)  $2y'' - 5y' - 3y = 0$

(2)  $y'' - 10y' + 25y = 0$

3. 試求下述微分方程的通解

(1)  $y'' + y' - 6y = 0$

(2)  $y'' + 4y' + 4y = 0$

4. 試求微分方程  $y''' + 3y'' + 3y' + y = 0$  的通解

**參考解答:**

1.  $y_2 = x^6$

2. (1)  $y = c_1e^{3x} + c_2e^{-\frac{x}{2}}$

(2)  $y = (c_1 + c_2x)e^{5x}$

3. (1)  $y = c_1e^{2x} + c_2e^{-3x}$

(2)  $y = (c_1 + c_2x)e^{-2x}$

4.  $y = (c_1 + c_2x + c_2x^2)e^{-x}$