

4-1-1

1. (10%) 解 $(4x + 3y^2)dx + 2xydy = 0$
2. (15%) 解 $y'' - 6y' - 7y = 0$
3. (15%) 解 $2x^2y'' + 4xy' + 5y = 0$
4. (15%) 解 $y'' + 3y' + 2.25y = -10e^{-1.5x}$
5. (15%) 利用 Frobenius method 求解 $x^2y'' + xy' + (x^2 - \frac{1}{4})y = 0$
6. (15%) 針對下列函數作 Laplace transforms
 - (1) $f(t) = t^2 - 3t + \cos 4t$
 - (2) $f(t) = (t^3 - 3t + 2)e^{-2t}$
 - (3) $f(t) = \begin{cases} \cos t & 0 \leq t < 2\pi \\ 2 - \sin t & t \geq 2\pi \end{cases}$
7. (15%) 利用 Laplace transform 求解 $ty'' + (t-1)y' + y = 0 \quad y(0) = 0$