

$$y'' - 2y' + 10y = 0, y'(0) = 0, y(0) = 3. [103 \text{ 北科大環工 2}]$$

$$[\text{解}] \text{特徵方程式 } \lambda^2 - 2\lambda + 10 = 0 \Rightarrow \lambda = 1 \pm 3i$$

$$y(x) = e^x(C_1 \cos 3x + C_2 \sin 3x) \Rightarrow y'(x) = e^x[(C_1 + 3C_2) \cos 3x + (-3C_1 + C_2) \sin 3x]$$

$$y'(0) = 0 \Rightarrow C_1 + 3C_2 = 0 \cdots \cdots \cdots (i)$$

$$y(0) = 3 \Rightarrow C_1 = 3$$

$$\text{代入}(i) \text{得 } C_2 = -1$$

$$\therefore y = e^x(3 \cos 3x - \sin 3x)$$



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