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

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

$\quad y(x) = e^x(C_1\cos3x + C_2\sin3x) \Rightarrow y'(x) = e^x[(C_1 + 3C_2)\cos3x + (-3C_1 + C_2)\sin3x]$

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

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

代入(i)得 $C_2 = -1$

$\quad \therefore y = e^x(3\cos3x - \sin3x)$