

解一階 O.D.E.  $(3x^2y^2 + e^y)\frac{dy}{dx} + 2(xy^3 + 1) = 0$  之通解。 [104 中央環工 2]

[解]原式  $\Rightarrow (3x^2y^2 + e^y)dy + 2(xy^3 + 1)dx = 0$

$$xy^2(3xdy + 2ydx) + e^y dy + 2dx = 0$$

$$d(x^2y^3) + de^y + 2dx = 0 \Rightarrow \int d(x^2y^3) + \int de^y + \int 2dx = C \Rightarrow x^2y^3 + e^y + 2x = C$$