

系級：_____ 學號：_____ 姓名：_____

1. 試以變數變換將下述 ODE 轉換為變數分離型 ODE 求解：

$$y' = \frac{x+2y+7}{-2x+y-9}$$

2. 試求解下述常微分方程式

$$(1) \frac{dy}{dx} = \frac{-2xy^3+2}{3x^2y^2+e^y}$$

$$(2) (x+y)dx + (x \ln|x|)dy = 0$$

$$(3) (y^2 - y)dx + xdy = 0$$

$$(4) (2y^2 - 9xy)dx + (3xy - 6x^2)dy = 0$$

[參考解答]

$$1. (x+5)^2 + 4(x+5)(y+1) - (y+1)^2 = C$$

$$2. (1) x^2y^3 - 2x + e^y = C$$

$$(2) x + y \cdot \ln|x| = C$$

$$(3) x - \frac{y}{x} = C$$

$$(4) x^2y^3 - 3x^3y^2 = C$$