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試求下述微分方程式：

1. (1)  $\frac{dy}{dx} = \left(\frac{2x+y-1}{x-2}\right)^2$

(2)  $\frac{dy}{dx} = \frac{2x+y-1}{4x+2y-4}$

(3)  $y' = (x+y-2)^2$ ,  $y(0) = 2$  (hint:  $u = x+y-2$ )

試以正合法求下述微分方程式：

2. (1)  $\frac{dy}{dx} = \frac{2x - e^x \sin y}{e^x \cos y + 1}$

(2)  $(\cos x - 2xy) + (e^y - x^2)y' = 0$ ,  $y(1) = 4$

(3)  $2y^2 + ye^{xy} + (4xy + xe^{xy} + 2y)y' = 0$

(4)  $3x^2 + xy^\alpha - x^2y^{\alpha-1}y' = 0$  為正合 ODE，求  $\alpha$  與 ODE 之解？