

$$1, x \sin(y) y' = \cos(y)$$

$$x \sin(y) \frac{dy}{dx} = \cos(y)$$

$$\tan(y) dy = \frac{1}{x} dx$$

$$\int \tan(y) dy = \int \frac{1}{x} dx$$

$$-\ln |\cos(y)| = \ln |x| + c$$

$$\sec(y) = e^{(\ln|x|+c)}$$

$$\sec(y) = Ax$$

$$2, y' + \frac{2}{x+1} y = 3; y(0) = 5$$

$$I = e^{\int \frac{2}{x+1} dx} = e^{2 \ln|(x+2)|} = (x+2)^2$$

$$Iy = \int Ig(x) dx = \int 3(x+1)^2 dx = (x+1)^3 + c$$

$$y = (x+1) + \frac{c}{(x+1)^2}$$

$$y(0) = 5 = (0+1) + \frac{c}{(0+1)^2}$$

$$c = 4$$

$$y(x) = (x+1) + \frac{4}{(x+1)^2}$$

$$3, 4xy + 2x^2y + (2x^2 + 3y^2)y' = 0$$

$$M = (4xy + 2x^2y), N = (2x^2 + 3y^2)$$

$$\frac{\partial M}{\partial y} = 4x + 2x^2, \frac{\partial N}{\partial x} = 4x$$

$$\frac{\partial M}{\partial y} \neq \frac{\partial N}{\partial x}$$

故不為正合

參考解答 by 周克勳