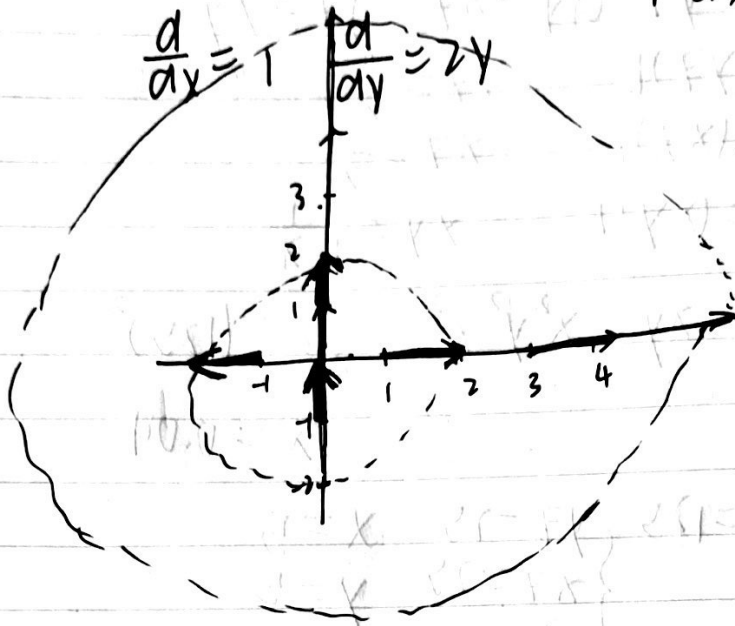


Quiz 17.

Q1. Sketch the vector planar vector field.

$$F = (x, y^2)$$

$$F(x, y) = x\mathbf{i} + y^2\mathbf{j}$$



$$F(1, 0) = (1, 0)$$

$$F(0, 1) = (0, 1)$$

$$F(-1, 0) = (-1, 0)$$

$$F(0, 0) = 0$$

$$F(0, -1) = (0, 1)$$

$$F(3, 0) = (3, 0)$$

$$F(0, 2) = (0, 4)$$

$$F(0, -2) = (0, 4)$$

Q2. $F = (y \cos(xy), x \cos(xy))$

$$\nabla \times F = \begin{vmatrix} \mathbf{i} & \mathbf{j} \\ \frac{\partial}{\partial x} & \frac{\partial}{\partial y} \\ y \cos(xy) & x \cos(xy) \end{vmatrix}$$

$$\nabla \times F = \frac{\partial}{\partial x} (x \cos(xy)) - \frac{\partial}{\partial y} (y \cos(xy))$$

$$= \frac{\partial}{\partial x} (x \cos(xy)) - \frac{\partial}{\partial y} (y \cos(xy))$$

$$= 0$$

$$f_x = y \cos(xy)$$

$$f = \int y \cos(xy) dx = \sin(xy) + g(y)$$

$$x \cos(xy) + g_y = x \cos(xy)$$

$$\therefore g_y = 0$$

$$\therefore f = \sin(xy)$$

the potential function is $f = \sin(xy)$

