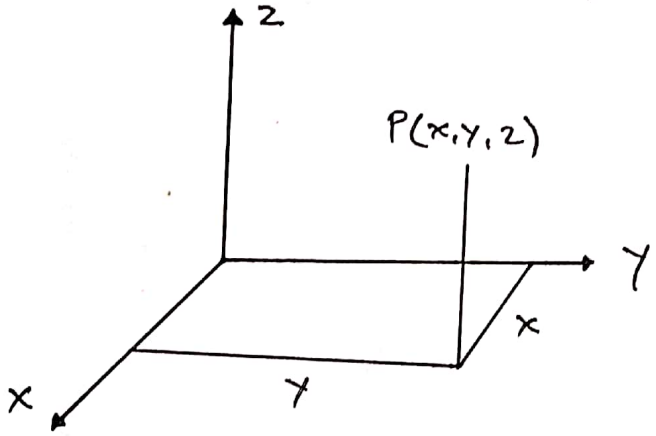
Nama : Neo Safitri
NPM : 2018022006
Kelas : B
Prodi : Pendidikan Fisika

> koordinat Cartesius (x, y, z)



$$\vec{ar} = \hat{i}dx + \hat{j}dy + \hat{k}dz$$

$$\vec{ab} = dx\,dy\,dz$$

=> Gradien :

$$\nabla t = \hat{i}\frac{\partial t}{\partial x} + \hat{j}\frac{\partial t}{\partial y} + \hat{k}\frac{\partial t}{\partial z}$$

=> Divergensi :

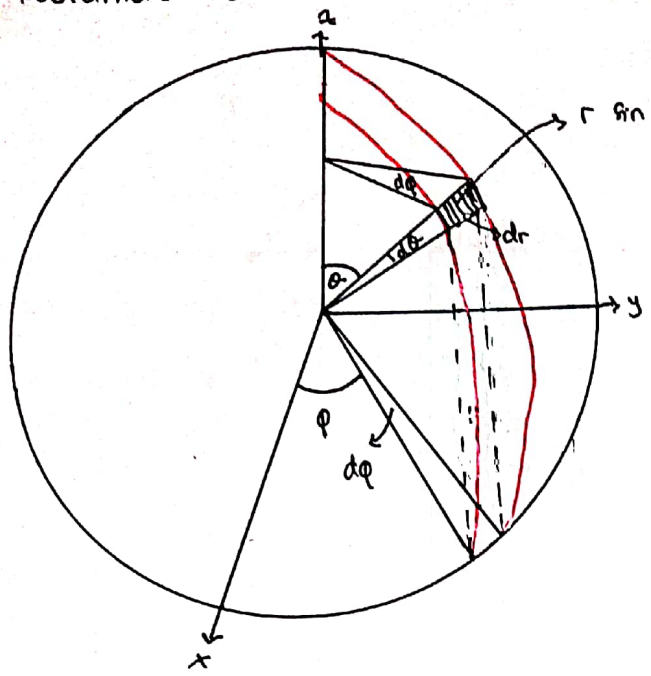
$$\nabla \cdot \vec{v} = \frac{\partial v_x}{\partial x} + \frac{\partial v_y}{\partial y} + \frac{\partial v_z}{\partial z}$$

=> Rotasi :

$$\nabla \times \vec{v} = \hat{i}\left(\frac{\partial v_z}{\partial y} - \frac{\partial v_y}{\partial z}\right) + \hat{j}\left(\frac{\partial v_x}{\partial z} - \frac{\partial v_z}{\partial x}\right) + \hat{k}\left(\frac{\partial v_y}{\partial x} - \frac{\partial v_x}{\partial y}\right).$$

$$= \begin{vmatrix} \hat{i} & \hat{j} & \hat{k} \\ \frac{\partial}{\partial x} & \frac{\partial}{\partial y} & \frac{\partial}{\partial z} \\ v_x & v_y & v_z \end{vmatrix}$$

> koordinat bola



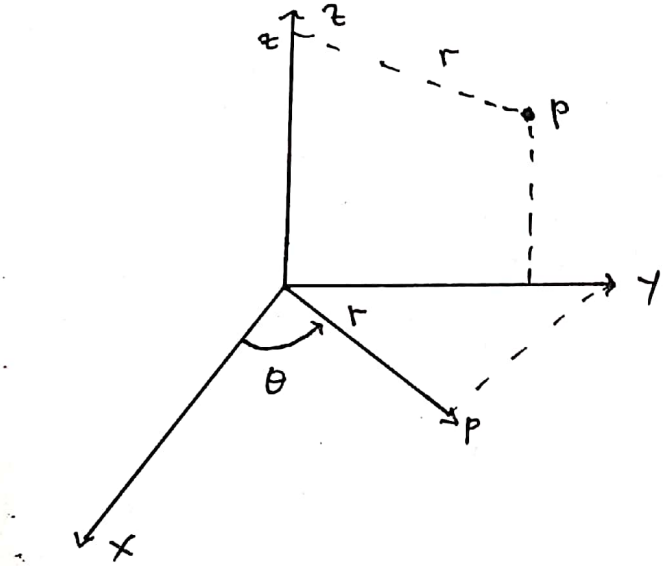
$x = r \sin\theta \cos\varphi$

$y = r \sin\theta \sin\varphi$

$z = r \cos\theta$

$dv = r^2 \sin\theta \, dr \, d\theta \, d\varphi$

> koordinat Silinder



$\sin\theta = \frac{y}{r} = y = r\sin\theta$ } sama dengan koordinat Polar

$\lambda = r\cos\alpha$

$z = z$ (tidak dipengaruhi θ atau r)

=> Elemen volume :

$dv = \partial r \cdot r\partial\theta \cdot \partial z$

$dv = r \, \partial r \, \partial\theta \, \partial z$

=> Elemen Permukaan bidang tertentu

$d\Delta = r \, \partial\theta \, \partial z$

=> Elemen Panjang

$\partial r^2 = \partial r^2 + r^2 \partial\theta^2 + \partial z^2$