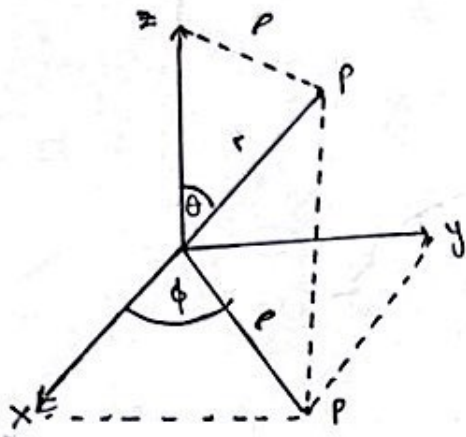


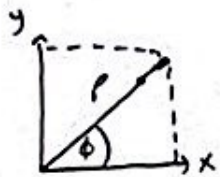
Nama : Jestica Dwi Cahyani Utari

NPM : 2013022059

- Sistem koordinat bola



- analisis x y

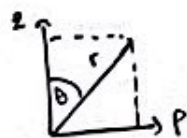


$$\sin \phi = \frac{y}{\rho}$$

$$y = \rho \sin \phi$$

$$x = \rho \cos \phi$$

- analisis z P



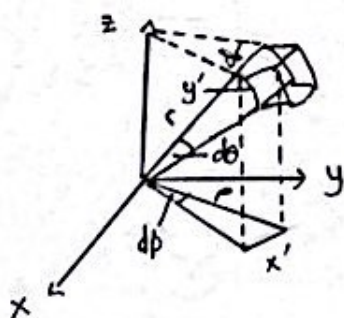
$$z = r \cos \theta$$

$$\rho = r \sin \theta$$

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

$$y = r \sin \theta \sin \phi$$

$$z = r \cos \theta$$



$$\sin \theta d\theta = \frac{x'}{\rho}$$

$$d\phi = \frac{x'}{r \sin \theta}$$

$$x' = r \sin \theta d\phi$$

$$\sin d\theta = \frac{y'}{r}$$

$$y' = r d\theta$$

jadi, $dv = \rho \times \Delta x \times \Delta y \times \Delta z$

$$= dr \cdot r d\theta \cdot r \sin \theta d\phi$$

$$= r^2 \sin \theta dr d\theta d\phi$$

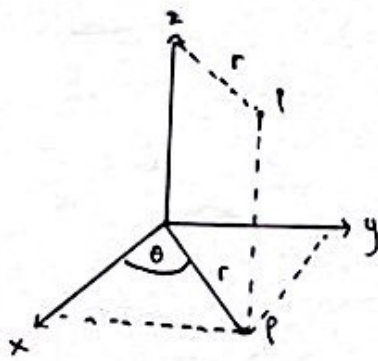
$$dA = \rho \times \Delta x \times \Delta y$$

$$= r d\theta \cdot r \sin \theta d\phi$$

$$= r^2 \sin \theta d\theta d\phi$$

$$dL^2 = dr^2 + r^2 d\theta^2 + r^2 \sin^2 \theta d\phi^2$$

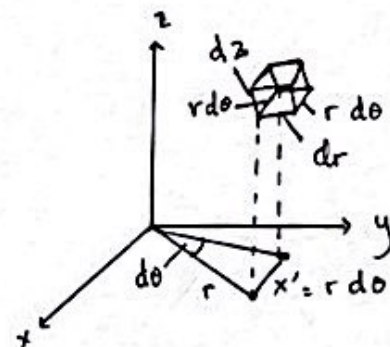
• Sistem koordinat silinder



$$\sin \theta = \frac{y}{r}, y = r \sin \theta$$

$$x = r \cos \theta$$

$$z = z$$



$$\sin d\theta = \frac{x'}{r}$$

$$x' = r \sin \theta d\theta$$

$$x' = r d\theta$$

$$dv = dr \cdot r d\theta \cdot dz$$

$$= r dr d\theta dz$$

$$dA = r d\theta dz$$

$$ds^2 = dr^2 + r^2 d\theta^2 + dz^2$$