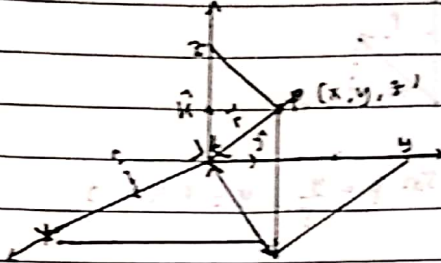


Nama: Atikkotunnajah

Npm: 2013022056

1. Sistem Koordinat Kartesius

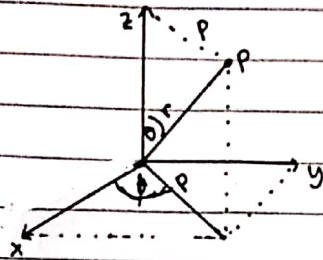


$$\vec{r} = x\hat{i} + y\hat{j} + z\hat{k}$$

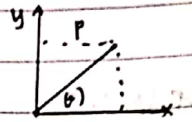
$$|\vec{r}| = \sqrt{x^2 + y^2 + z^2}$$

$$\hat{r} = \frac{\vec{r}}{|\vec{r}|} = \frac{x\hat{i} + y\hat{j} + z\hat{k}}{\sqrt{x^2 + y^2 + z^2}}$$

▷ Sistem Koordinat Bola



• analisis x y



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

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

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

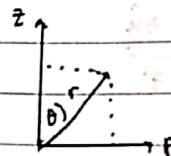
$$y = r \sin \theta \cos \phi$$

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

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

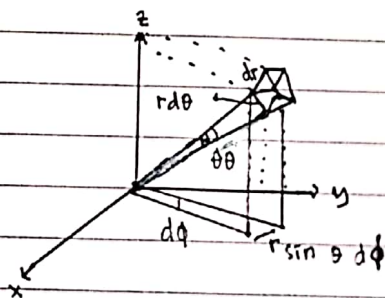
$$z = r \cos \theta$$

• Analisis z p



$$z = r \cos \theta$$

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



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

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

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

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

$$y' = r d\theta$$

• Volume : $dv = dr \cdot r d\theta \cdot r \sin \theta d\phi$

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

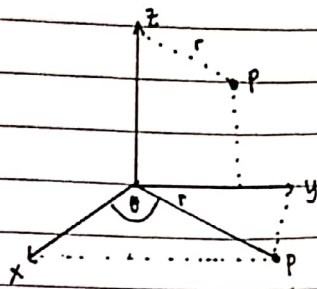
$$dv = r^2 \sin \theta dr d\theta d\phi$$

• Luas : $dA = r d\theta \cdot r \sin \theta d\phi$

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

• panjang : $ds^2 = dr^2 + r^2 d\theta^2 + r^2 \sin^2 \theta d\phi^2$

3 sistem koordinat silinder

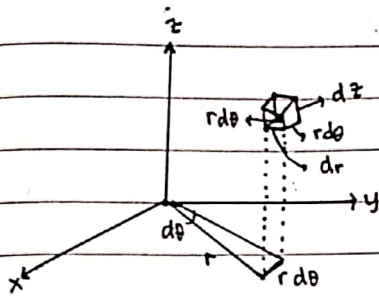


$$\sin \theta = \frac{y}{r}$$

$$y = r \sin \theta$$

$$x = r \cos \theta$$

$$z = z$$



$$\bullet \text{ Volume: } dV = dr \cdot r d\theta \cdot dz$$

$$dV = r dr d\theta dz$$

$$\bullet \text{ Luas: } dA = r d\theta \cdot dz$$

$$\bullet \text{ Panjang: } ds^2 = dr^2 + r^2 d\theta^2 + dz^2$$

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

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

$$x' = r d\theta$$