ATENSIDEN

FISIKA

VEKTOR

OPERASI VEKTOR

NO. 40

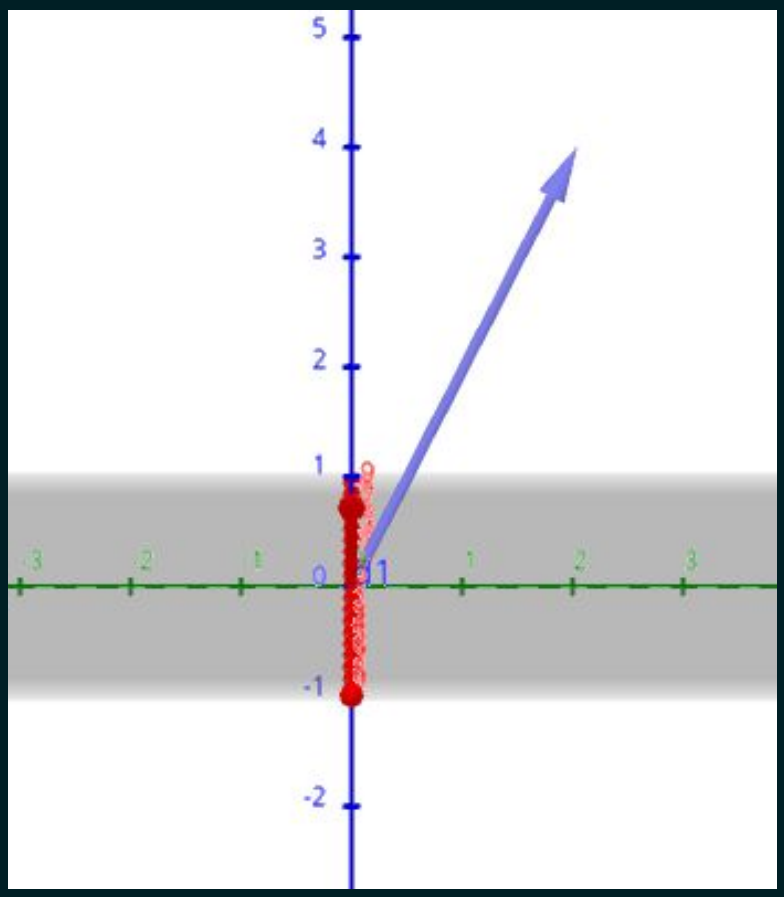
ATENSIDEN

FISIKA

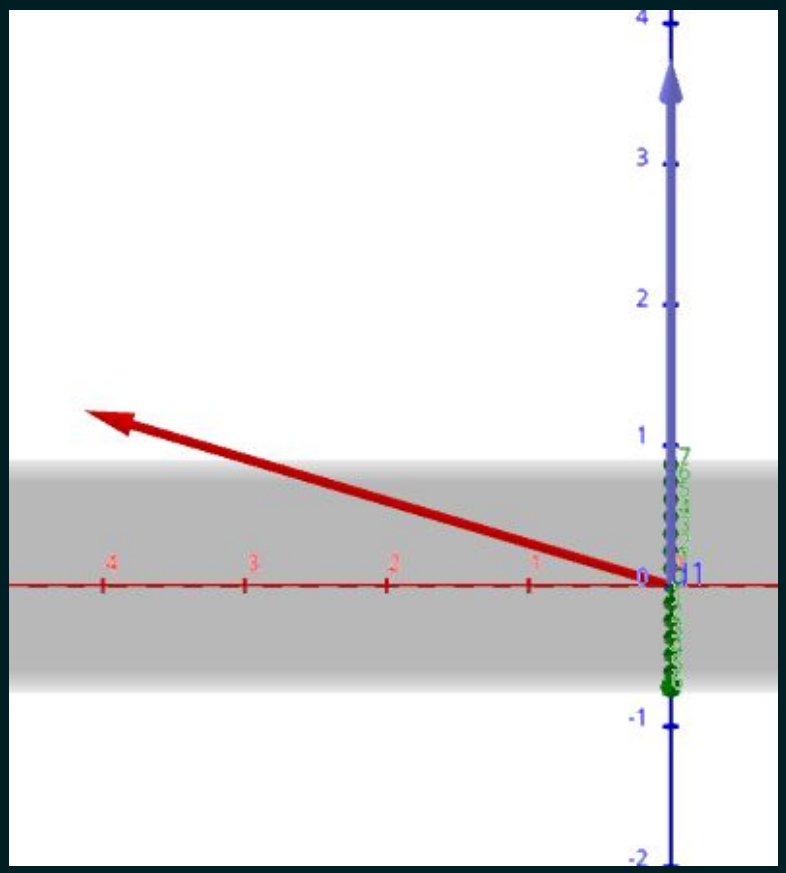
••40 Displacement $\vec{d}_1$ is in the yz plane 63.0° from the positive direction of the y axis, has a positive z component, and has a magnitude of 4.50 m. Displacement $\vec{d}_2$ is in the xz plane 30.0° from the positive direction of the x axis, has a positive z component, and has magnitude 1.40 m. What are (a) $\vec{d}_1 \cdot \vec{d}_2$, (b) $\vec{d}_1 \times \vec{d}_2$, and (c) the angle between $\vec{d}_1$ and $\vec{d}_2$?

- **Diketahui**
  - **Vektor d1 pada bidang yz memiliki sudut 63 derajat terhadap sumbu y positif, memiliki komponen z positif dan besar 4.5 m**
  - **Vektor d2 pada bidang xz dengan sudut 30 derajat terhadap sumbu x positif dan besar vektor 1.4 m**
- **Ditanya**
  - **Hasil perkalian titik kedua vektor**
  - **Hasil perkalian silang kedua vektor**
  - **Sudut di antara kedua vektor**

- Solusi



Vektor d1 di bidang xz



Vektor d2 di bidang yz

- Solusi

$$\begin{bmatrix} d_1 \\ d_2 \end{bmatrix} = \begin{bmatrix} 0 & 4.5\cos 63^\circ & 4.5\sin 63^\circ \\ 1.4\cos 30^\circ & 0 & 1.4\sin 30^\circ \end{bmatrix}$$

$$\begin{bmatrix} d_1 \\ d_2 \end{bmatrix} = \begin{bmatrix} 0 & 2.04 & 4.01 \\ 1.21 & 0 & 0.7 \end{bmatrix}$$

$$d_1 \times d_2 = \begin{vmatrix} \hat{i} & \hat{j} & \hat{k} \\ 0 & 2.04 & 4.01 \\ 1.21 & 0 & 0.7 \end{vmatrix}$$

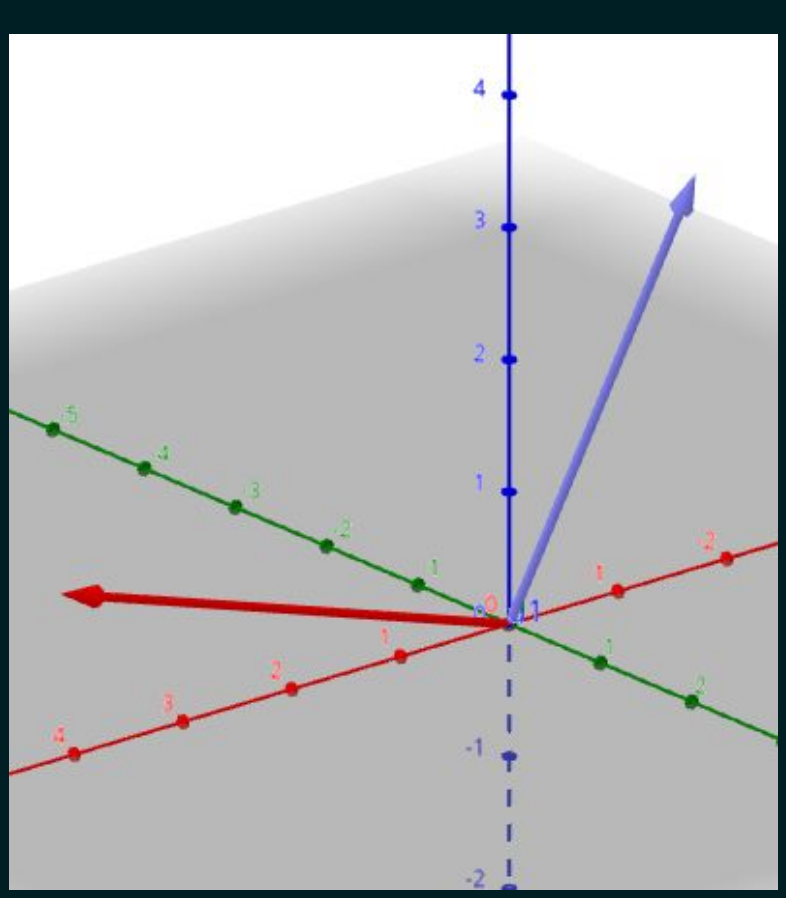
$$d_1 \times d_2 = [1.43 \quad 4.85 \quad -2.47]\ \mathbf{m}^2$$

$$d_1 \cdot d_2 = 4.01 \cdot 0.7$$

$$d_1 \cdot d_2 = 2.81\ \mathbf{m}^2$$

$$\theta = \arccos\left(\frac{2.81}{4.5 \cdot 1.4}\right)$$

$$\theta = 63.51^\circ$$



SUMBER:
Halliday, D., Resnick, R., & Walker, J. (2013). *Fundamentals of physics*. John Wiley & Sons.