

Date

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Latsol 1 Tutor KUV

1. $m = [5, -2, 1]$

$n = [-6, -2, 4]$

a. $p = -2m + 0,5n$

$$= -2[5, -2, 1] + [-6, -2, 4] \cdot 0,5$$

$$= [-10, 4, -2] + [-3, -1, 2] = [-13, 3, 0]$$

b. Tentukan ~~determinan~~ sudut antara m dan n .

$m \cdot n = \|m\| \cdot \|n\| \cdot \cos \theta$

$$\theta = \cos^{-1} \frac{m \cdot n}{\|m\| \cdot \|n\|} = \cos^{-1} \frac{5 \cdot (-6) + (-2) \cdot (-2) + 1 \cdot 4}{\sqrt{5^2 + (-2)^2 + 1^2} \cdot \sqrt{(-6)^2 + (-2)^2 + 4^2}} = \cos^{-1} \frac{-22}{\sqrt{30} \cdot \sqrt{56}}$$

$$\theta = 122,96^\circ$$

c. Proyeksi vektor antara m dan n

$$s = \frac{m \cdot n}{\|n\|} = \frac{5 \cdot (-6) + (-2) \cdot (-2) + 1 \cdot 4}{\sqrt{(-6)^2 + (-2)^2 + 4^2}} = \frac{-22}{\sqrt{56}}$$

Proyeksi vektor antara m dan n

$$p = \left(\frac{m \cdot n}{\|n\|^2} \right) n = \frac{5 \cdot (-6) + (-2) \cdot (-2) + 1 \cdot 4}{\sqrt{(-6)^2 + (-2)^2 + 4^2}^2} \cdot [-6, -2, 4] = \frac{-22}{56} \cdot [-6, -2, 4]$$

$$= \left[\frac{-33}{14}, \frac{11}{14}, \frac{-22}{14} \right]$$

2. Determinan M.

$$M = \begin{bmatrix} -5 & 3 & 1 \\ 2 & 1 & 1 \\ -4 & 3 & 1 \end{bmatrix}$$

$$|M| = (-5 \cdot 1 \cdot 1 + 3 \cdot 1 \cdot -4 + 1 \cdot 2 \cdot 3) - (-9 \cdot 1 \cdot 1 + 3 \cdot 1 \cdot -5 + 1 \cdot 2 \cdot 3)$$

$$= (-5 - 12 + 6) - (-9 - 15 + 6)$$

$$= -11 + 24 = 13$$

Latsol 2

1. $U = [1, 0, 0]$, $V = [0, 12, 0]$

$$U \times V = \begin{vmatrix} \hat{i} & \hat{j} & \hat{k} \\ 1 & 0 & 0 \\ 0 & 12 & 0 \end{vmatrix} = \begin{vmatrix} 1 & 0 \\ 0 & 12 \end{vmatrix} \hat{k} = 12 \hat{k}$$

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$$\begin{aligned} \|u \times v\| &= \|u\| \|v\| \sin \theta \\ &= \sqrt{\|u\|^2 \cdot \|v\|^2 - (u \cdot v)^2} \\ &= \sqrt{1^2 \cdot 12^2 - 0} \end{aligned}$$

$$\|u \times v\| = 12$$

Latzol 3

1. Inverse dari

$$B = \begin{pmatrix} 1 & 2 & 2 \\ 2 & -1 & 1 \\ 1 & 3 & 2 \end{pmatrix}$$

$$C_B = \begin{pmatrix} M_{11} & -M_{12} & -M_{13} \\ -M_{21} & M_{22} & -M_{23} \\ -M_{31} & -M_{32} & M_{33} \end{pmatrix}$$

$$\begin{aligned} \det B &= 1 \cdot (-1 \cdot 2 + 2 \cdot 2) - 2 \cdot (-2 + 2) + 2 \cdot (-2 + 2) \\ &= -1 \cdot (-2 + 2) + 2 \cdot (-2 + 2) + 2 \cdot (-2 + 2) \\ &= -2 + 2 + 2 - (-2 + 2 + 8) \\ &= 3 \end{aligned}$$

$$\text{Adj}(B) = \begin{pmatrix} -5 & 2 & 4 \\ -3 & 0 & 3 \\ 7 & -1 & -5 \end{pmatrix}$$

$$B^{-1} = \frac{1}{\det B} \cdot \text{Adj} B = \frac{1}{3} \begin{pmatrix} -5 & 2 & 4 \\ -3 & 0 & 3 \\ 7 & -1 & -5 \end{pmatrix}$$

$$\begin{pmatrix} -5/3 & 2/3 & 4/3 \\ -1 & 0 & 1 \\ 7/3 & -1/3 & -5/3 \end{pmatrix}$$