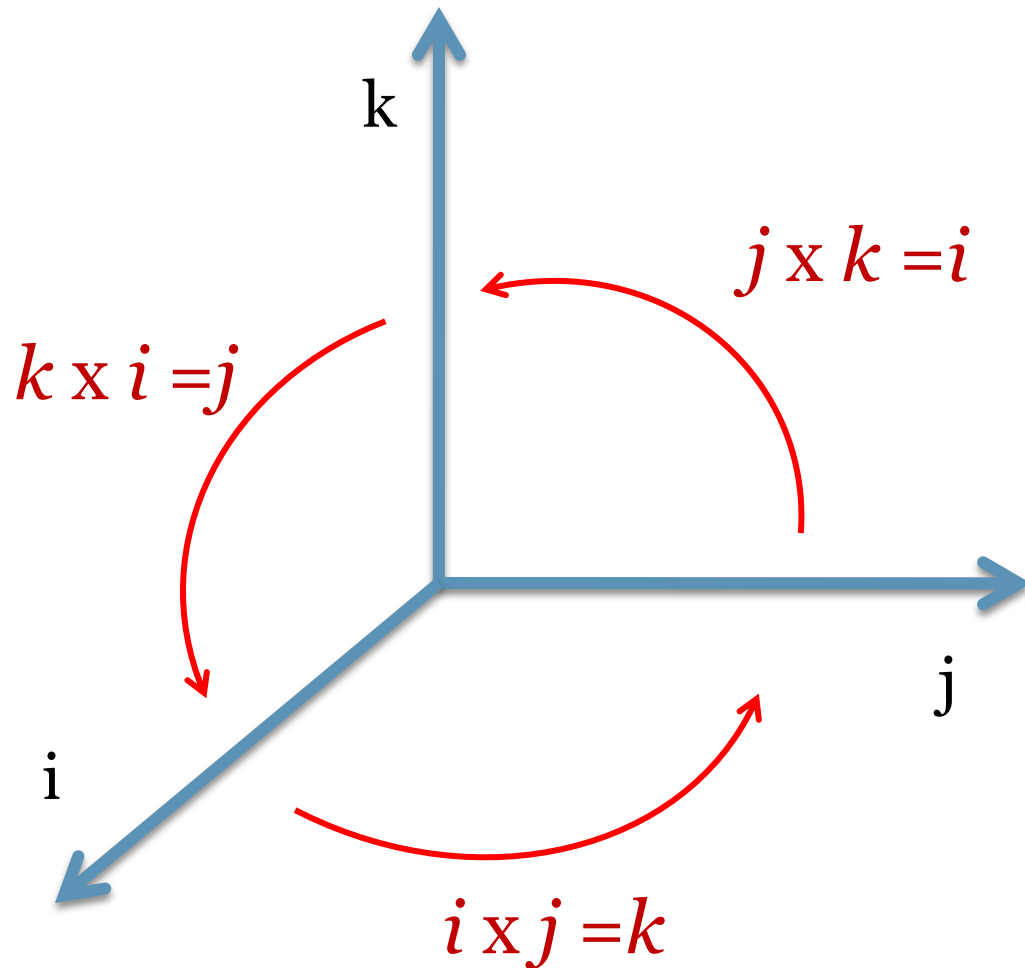


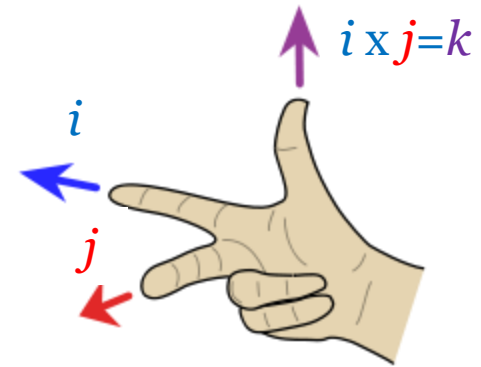
Cross Product - Vector

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Aturan *tangan Kanan*



$$\begin{array}{ll} j \times i = -k & i \times i = 0 \\ k \times j = -i & j \times j = 0 \\ i \times k = -j & k \times k = 0 \end{array}$$

Operasi Vektor

$$A = \langle a_1, a_2, a_3 \rangle$$

$$B = \langle b_1, b_2, b_3 \rangle$$

$$A \times B = \langle a_1 \mathbf{i}, a_2 \mathbf{j}, a_3 \mathbf{k} \rangle \times \langle b_1 \mathbf{i}, b_2 \mathbf{j}, b_3 \mathbf{k} \rangle$$

Vektor Kolom

$$\begin{pmatrix} a_1 \\ a_2 \\ a_3 \end{pmatrix} \times \begin{pmatrix} b_1 \\ b_2 \\ b_3 \end{pmatrix} = \begin{pmatrix} a_2 b_3 - a_3 b_2 \\ a_1 b_3 - a_3 b_1 \\ a_1 b_2 - a_2 b_1 \end{pmatrix}$$

Matrix - Cross Product

Aturan Matrik

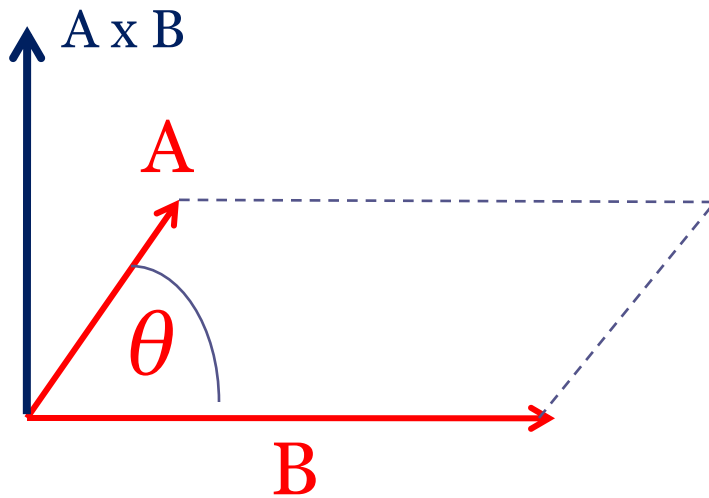
$$A \times B = \begin{vmatrix} i & j & k \\ a_1 & a_2 & a_3 \\ b_1 & b_2 & b_3 \end{vmatrix}$$

Cofactor:

$$= \begin{vmatrix} a_2 & a_3 \\ b_2 & b_3 \end{vmatrix} i - \begin{vmatrix} a_1 & a_3 \\ b_1 & b_3 \end{vmatrix} j + \begin{vmatrix} a_1 & a_2 \\ b_1 & b_2 \end{vmatrix} k$$

$$\mathbf{A} \times \mathbf{B} = (a_2 b_3 - a_3 b_2) \mathbf{i} - (a_1 b_3 - a_3 b_1) \mathbf{j} + (a_1 b_2 - a_2 b_1) \mathbf{k}$$

Geometric Cross Product



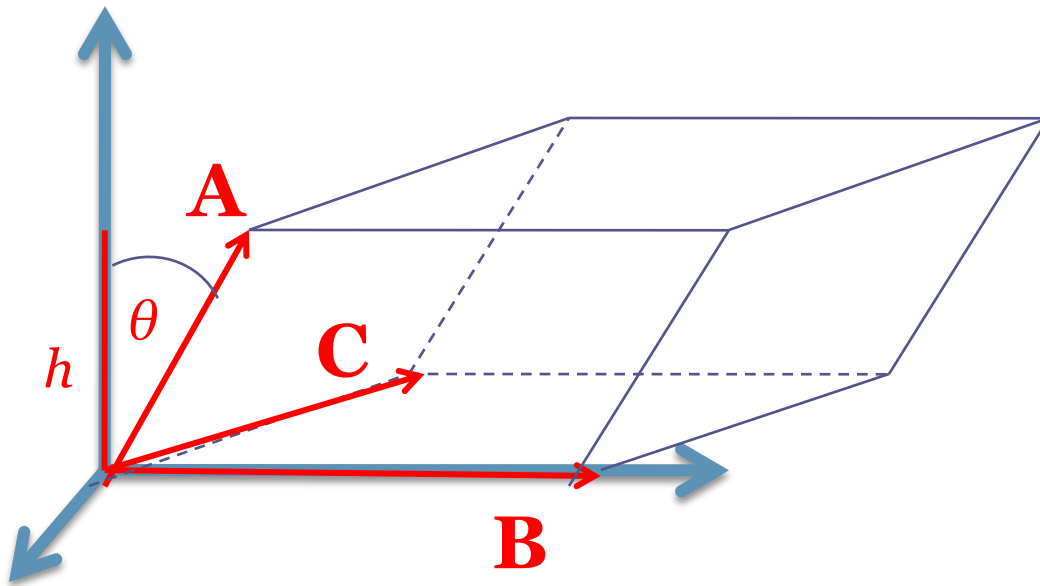
$$|\mathbf{A} \times \mathbf{B}| = |\mathbf{A}| |\mathbf{B}| \sin \theta$$

$$|\mathbf{A} \times \mathbf{B}|^2 = |\mathbf{A}|^2 |\mathbf{B}|^2 - (\mathbf{A} \cdot \mathbf{B})^2$$

$$\text{Luas} = |\mathbf{A} \times \mathbf{B}|$$

Volume [balok genjang]

$$\text{Volume} = |\mathbf{A} \cdot (\mathbf{B} \times \mathbf{C})|$$

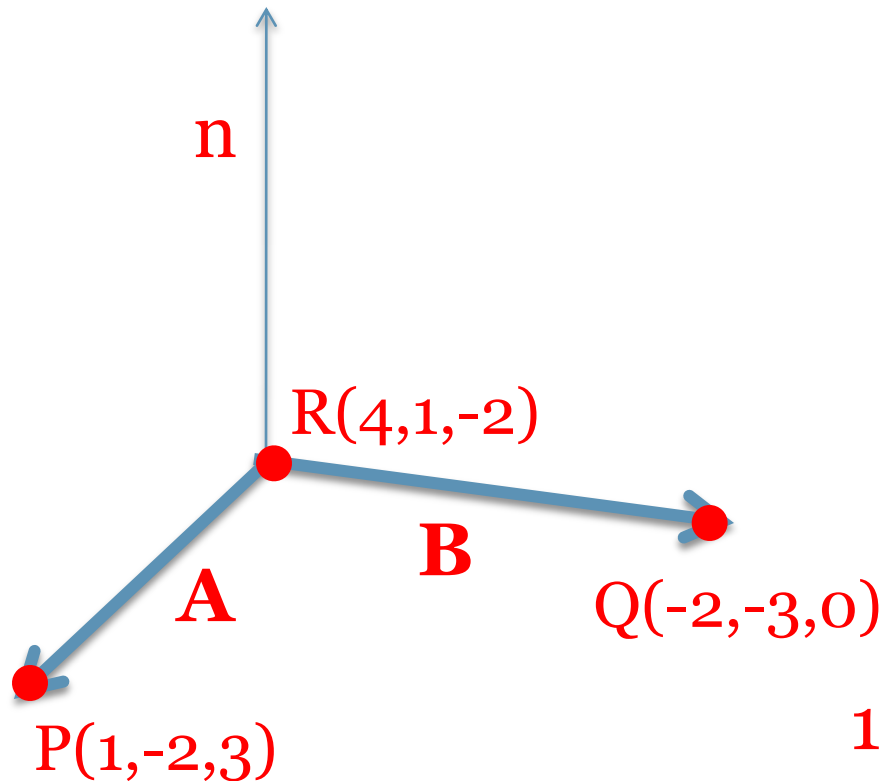


$$V = \begin{vmatrix} \mathbf{a}_1 & \mathbf{a}_2 & \mathbf{a}_3 \\ \mathbf{b}_1 & \mathbf{b}_2 & \mathbf{b}_3 \\ \mathbf{c}_1 & \mathbf{c}_2 & \mathbf{c}_3 \end{vmatrix}$$

$$h = |\mathbf{A}| \text{abs}(\cos \theta)$$

$$\text{Volume} = h |\mathbf{B} \times \mathbf{C}|$$

Persamaan Bidang



$$A = \langle -3, -3, 5 \rangle$$

$$B = \langle -6, -4, 2 \rangle$$

$$A \times B = \begin{vmatrix} i & j & k \\ -3 & -3 & 5 \\ -6 & -4 & 2 \end{vmatrix}$$

$$A \times B = 14i - 24j - 6k$$

$$14(x-4) - 24(y+1) - 6(z+2) = 0$$

Pers.



$$14x - 24y - 6z + 44 = 0$$

Latihan Soal

- Cross Product