VEKTORJI

1. LINEARNA ODVISNOST

$\vec{v_2} = x \cdot \vec{v_1}$

$\vec{v_2}$ JE LIN. ODVISEN OD $\vec{v_1}$.

$\vec{v_3} = x \cdot \vec{v_1} + y \cdot \vec{v_2}$

$\vec{v_3}$ LIN. ODV. OD $\vec{v_1}$ IN $\vec{v_2}$

$\vec{v_1} + \vec{v_2} = 0$ — LINEARNO NEODVISNA

SKALARNI PRODUKT $= S \square$

$\vec{x} \cdot \vec{y} = |\vec{x}| \cdot |\vec{y}| \cdot \cos\varphi$

$pr_{\vec{x}}\vec{y} = \dfrac{\vec{x} \cdot \vec{y}}{|\vec{x}|^2} \cdot \vec{x}$ (PROJ. y NA x)

$|pr_{\vec{x}}\vec{y}| = \dfrac{\vec{x} \cdot \vec{y}}{|\vec{x}|}$

$\cos\varphi = \dfrac{\vec{x} \cdot \vec{y}}{|\vec{x}| \cdot |\vec{y}|}$

$\vec{x} \perp \vec{y} = \vec{x} \cdot \vec{y} = 0$

VEKTORSKI PRODUKT $= S \square$

$\vec{c} \perp \vec{a}$ IN $\vec{c} \perp \vec{b}$

$|\vec{c}| = |\vec{a}| \cdot |\vec{b}| \cdot \sin\varphi = S \square$

$\vec{a} \times \vec{b} = -(\vec{b} \times \vec{a})$

$\vec{c} = \vec{a} \times \vec{b}$

DETERMINANTA

$\begin{vmatrix} a & b \\ c & d \end{vmatrix} = ad - cb$

$\vec{x} \times \vec{y} = \left(\underbrace{\begin{vmatrix} x_2 & -x_3 \\ y_2 & -y_3 \end{vmatrix}}_{\vec{v_2}}, -\begin{vmatrix} x_1 & x_3 \\ y_1 & y_3 \end{vmatrix}, \begin{vmatrix} x_1 & x_2 \\ y_1 & y_2 \end{vmatrix} \right)$

MEŠANI PRODUKT $= V$ PARALELPIP.

$(\vec{a} \times \vec{b}) \cdot \vec{c}$

$|(\vec{a} \times \vec{b}) \cdot \vec{c}| = V$ PARALELP.

V TRISTRANE PIRAMIDE

$V = \dfrac{|(\vec{a}, \vec{b}, \vec{c})|}{6}$

$(\vec{a}, \vec{b}, \vec{c}) = (\vec{a} \times \vec{b}) \cdot \vec{c}$

$(\vec{x} \times \vec{y}) \times \vec{z} = (\vec{x} \times \vec{z}) \cdot \vec{y} - (\vec{x} \times \vec{z}) \cdot \vec{x}$

PREMICA

$(x, y, z) = \underbrace{(x_A, y_A, z_A)}_{-\vec{r_A}} + \lambda(a, b, c)$ → SMERNI VEKTOR ← TOČKA

$x = x_A + \lambda a$
$y = y_A + \lambda b$
$z = z_A + \lambda c$

$\lambda = \dfrac{x - x_A}{a} = \dfrac{y - y_A}{b} = \dfrac{z - z_A}{c}$

TOČKA $A(1, 2, 1)$ $B(2, 5, 3)$ $\vec{AB} = (1, 3, 2)$ VEKTOR

$x = 1 + 1\lambda$
$y = 2 + 3\lambda$
$z = 1 + 2\lambda$

$\lambda =$

RAVNINA

$$ax + by + cz = d$$

(a, b, c) – NORMALA

(a, b, c) – NORMALA RAVNINE $\vec{m}$

$$\vec{m} = \vec{AB} \times \vec{AC}$$ (A, B, C) – TOČKE NA RAVNINI

RAZDALJE

• MED TOČKAMA

$$d(A, B) = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2 + (z_2 - z_1)^2}$$

• MED TOČKO IN RAVNINO

$$d(T, \Sigma) = \frac{|ax_1 + by_1 + cz_1 - d|}{\sqrt{a^2 + b^2 + c^2}}$$

a, b, c – RAVNINA

x_1, y_1, z_1 – TOČKA

• MED TOČKO IN PREMICO

$$d = \frac{|\vec{p} \times \vec{PT}|}{|\vec{p}|}$$

$\vec{p}$ – SMERNI VEKTOR

P – TOČKA NA PREMICI

$\vec{PT}$ – VEKTOR

T – TOČKA

• MED PREMICAMA

$$d(p, q) = \frac{|(\vec{p} \times \vec{q}) \cdot \vec{PQ}|}{|\vec{p} \times \vec{q}|}$$

$\vec{p}$ – SMERNI VEKTOR p

$\vec{q}$ – SMERNI VEKTOR q

P, Q – TOČKI NA PREMICAH

• MED PREMICO IN RAVNINO

- SE SEKATA – RAZDALJA = 0
- SE NE SEKATA – $p \parallel \Sigma \Rightarrow d(P, \Sigma)$

• MED RAVNINAMA

- SE SEKATA – RAZDALJA = 0
- SE NE SEKATA $\Rightarrow d(P, \Sigma)$