

Vektori

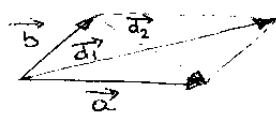
- 1) kolinearni vektori $\vec{a} = \lambda \cdot \vec{b}$
- 2) komplanarni vektori $V = 0$ (ili $D = 0$)
- 3) linearna zavisnost vektora $\vec{a}, \vec{b}, \vec{c}$
 $x \cdot \vec{a} + y \cdot \vec{b} + z \cdot \vec{c} = 0$
- 4) linearna kombinacija (rastavljanje) vektora \vec{c} pomoću vektora $\vec{a}, \vec{b}, \vec{a} \times \vec{b}$
 $\vec{c} = x \cdot \vec{a} + y \cdot \vec{b} + z \cdot (\vec{a} \times \vec{b})$

Vektor kroz 2 točke $A(x_A, y_A, z_A)$ $B(x_B, y_B, z_B)$

$$\vec{AB} = (x_B - x_A, y_B - y_A, z_B - z_A)$$

ili $\vec{AB} = (x_B - x_A)\vec{i} + (y_B - y_A)\vec{j} + (z_B - z_A)\vec{k}$

Dijagonale paralelograma



$$\vec{d}_1 = \vec{a} + \vec{b}$$

$$\vec{d}_2 = \vec{a} - \vec{b}$$

$$\vec{a} = \frac{1}{2}(\vec{d}_1 + \vec{d}_2)$$

$$\vec{b} = \frac{1}{2}(\vec{d}_1 - \vec{d}_2)$$

Modul, apsolutna vrijednost,
norma, duljina vektora:

$$|\vec{a}| = a = \sqrt{a^2} \quad (\text{općenito})$$

$$|\vec{a}| = a = \sqrt{a_x^2 + a_y^2 + a_z^2} \quad (\text{pravokutni prostor})$$

Skalarni produkt $\vec{a} \cdot \vec{b} = |\vec{a}| |\vec{b}| \cos \varphi$

$$\vec{a} \cdot \vec{b} = a_x b_x + a_y b_y + a_z b_z \quad (\text{pravokutni prostor})$$

$$\vec{a} \cdot \vec{b} = 0 \quad (\text{uvjet okomitosti})$$

Kut između 2 vektora



$$\cos \varphi = \frac{\vec{a} \cdot \vec{b}}{|\vec{a}| |\vec{b}|}$$

Skalarna projekcija vektora \vec{a} na vektor \vec{b} : $Pr_{\vec{b}} \vec{a} = \frac{\vec{a} \cdot \vec{b}}{|\vec{b}|}$

Vektorski produkt $\vec{a} \times \vec{b} = |\vec{a}| |\vec{b}| \sin \varphi$ (općenito)

$$\vec{a} \times \vec{b} = \begin{vmatrix} \vec{i} & \vec{j} & \vec{k} \\ a_x & a_y & a_z \\ b_x & b_y & b_z \end{vmatrix} \quad (\text{pravokutni prostorni koordinatni sustav})$$

Površina

paralelograma: $P = |\vec{a} \times \vec{b}|$

Površina

trokuta: $P = \frac{1}{2} |\vec{a} \times \vec{b}|$

Volumen

paralelepipeda: $V = (\vec{a} \times \vec{b}) \cdot \vec{c}$ ili

$$\begin{vmatrix} a_x & a_y & a_z \\ b_x & b_y & b_z \\ c_x & c_y & c_z \end{vmatrix}$$

Volumen tetraedra (piramide) $V_0 = \frac{1}{6} V$