

(Lectures)

GeoEx1:

$$1) |\vec{V}_1| = \sqrt{(3)^2 + (4)^2 + (4)^2} = 6,40$$

$$|\vec{V}_2| = \sqrt{(2)^2 + (3)^2 + (4)^2} = 5,38$$

$$|\vec{V}_3| = \sqrt{(5)^2 + (4)^2 + (3)^2} = 5,91$$

$$2) \vec{A} = 10\vec{i} - 2\vec{j} + 3\vec{k} \quad |\vec{A}| = \sqrt{(10)^2 + (2)^2 + (3)^2} = 10,65$$

$$\vec{B} = 9\vec{i} - 15\vec{j} + 15\vec{k} \quad |\vec{B}| = \sqrt{(9)^2 + (15)^2 + (15)^2} = 23,04$$

$$3) \vec{C} = 8\vec{i} - 5\vec{j} + 7\vec{k}$$

$$\vec{u}_C = \frac{\vec{C}}{C} = \frac{8}{\sqrt{138}}\vec{i} - \frac{5}{\sqrt{138}}\vec{j} + \frac{7}{\sqrt{138}}\vec{k}$$

$$\vec{V}_1 \cdot \vec{V}_3 = x_1 x_3 + y_1 y_3 + z_1 z_3$$

$$\vec{V}_1 \cdot \vec{V}_3 = 15 + 4 + 12$$

$$\vec{V}_1 \cdot \vec{V}_3 = 31$$

$$\cos \alpha = \frac{\vec{V}_1 \cdot \vec{V}_3}{|\vec{V}_1| |\vec{V}_3|} = \frac{31}{\sqrt{41} \cdot \sqrt{35}} = \frac{31}{37,88} \approx 0,82 \Rightarrow \alpha \approx 35,1^\circ$$

$$5) \vec{V}_2 \wedge \vec{V}_3 = \begin{vmatrix} \vec{i} & \vec{j} & \vec{k} \\ 2 & 3 & -4 \\ 5 & -1 & 3 \end{vmatrix} = 5\vec{i} - 26\vec{j} - 17\vec{k}$$

$$\vec{z} = x\vec{i} + y\vec{j} + z\vec{k} \text{ ou } \vec{A} + \vec{B} + \vec{z} = \vec{0}$$

$$\vec{A} + \vec{B} + \vec{z} = \begin{pmatrix} 10 \\ -2 \\ 3 \end{pmatrix} + \begin{pmatrix} 9 \\ -15 \\ 15 \end{pmatrix} + \begin{pmatrix} x \\ y \\ z \end{pmatrix} = \begin{pmatrix} 0 \\ 0 \\ 0 \end{pmatrix}$$

$$= \begin{pmatrix} 10+9+x \\ -2-15+y \\ 3+15+z \end{pmatrix} = \begin{pmatrix} 0 \\ 0 \\ 0 \end{pmatrix}$$

$$19+x=0$$

$$13+y=0$$

$$18+z=0$$

$$x = -19$$

$$y = -13$$

$$z = -18$$

$$\text{alors } \vec{z} = -19\vec{i} - 13\vec{j} - 18\vec{k}$$

②