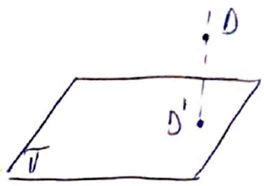
RJEŠENJA ZAVRŠNOG ISPITA IZ LINEARNE ALGEBRE

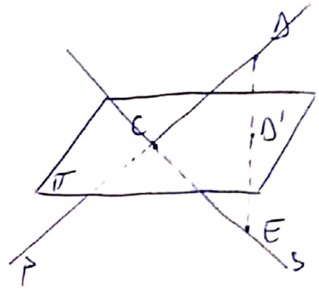


① a) $\vec{n} = 3\vec{i} - 3\vec{j} + 3\vec{k}$

$\pi \ldots \quad x - y + z = 3$

d - pravac kroz D okomit na π

$$d \ldots \begin{cases} x = \lambda + 4 \\ y = -\lambda + 2 \\ z = \lambda + 4 \end{cases} \qquad D' = d \cap \pi \qquad D' = (3,3,3)$$



b) D' je polovište dužine $\overline{DE}$ $\Rightarrow E(2,4,2)$

$s = CE \ldots \quad \frac{x}{2} = \frac{y+1}{5} = \frac{z-2}{0}$

② a) $A = \begin{bmatrix} \cos 2\alpha & \sin 2\alpha \\ \sin 2\alpha & -\cos 2\alpha \end{bmatrix} = \begin{bmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & -\frac{1}{2} \end{bmatrix}$ b) $A \cdot A = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$

③ Vidi predavanja ili knjižicu „Linearni operatori"

④ a) Svojstvene vrijednosti: $\lambda_1 = \lambda_2 = 0$, pripadni vektori $\begin{bmatrix} 1 \\ 0 \\ 1 \end{bmatrix}, \begin{bmatrix} 0 \\ 1 \\ 2 \end{bmatrix}$

$\lambda_3 = 12$, pripadni vektor $\begin{bmatrix} 1 \\ 2 \\ -1 \end{bmatrix}$

AA^t se može dijagonalizirati

b) $\left\{ \frac{1}{\sqrt{2}} \begin{bmatrix} 1 \\ 0 \\ 1 \end{bmatrix}, \frac{1}{\sqrt{3}} \begin{bmatrix} -1 \\ 1 \\ 1 \end{bmatrix}, \frac{1}{\sqrt{6}} \begin{bmatrix} 1 \\ 2 \\ -1 \end{bmatrix} \right\}$ c) $(BB^t)^t = BB^t$, a svaka simetrična matrica je slična dijagonalnoj

⑤ a) • $\langle x | y \rangle = x_1 y_1 + x_1 y_2 + x_2 y_1 + 2 x_2 y_2$

• $\alpha = -\frac{2}{3}$

b) A mora biti regularna matrica