(1) 
$$A = \begin{bmatrix} 1 & 2a \\ 2 & 3 \end{bmatrix}$$
,  $Z_5$ 

(a)  $det(A) \neq 0$ 

$$3 - 4a \neq 0$$

$$4 \cdot 4 \cdot 3 = 4$$

$$4 \cdot 2 = 3$$

$$0 \neq \frac{3}{4} = 3 \cdot 4^{-1}$$

$$4 \cdot 3 = 2$$

$$4 \cdot 4 \cdot 3 = 3$$

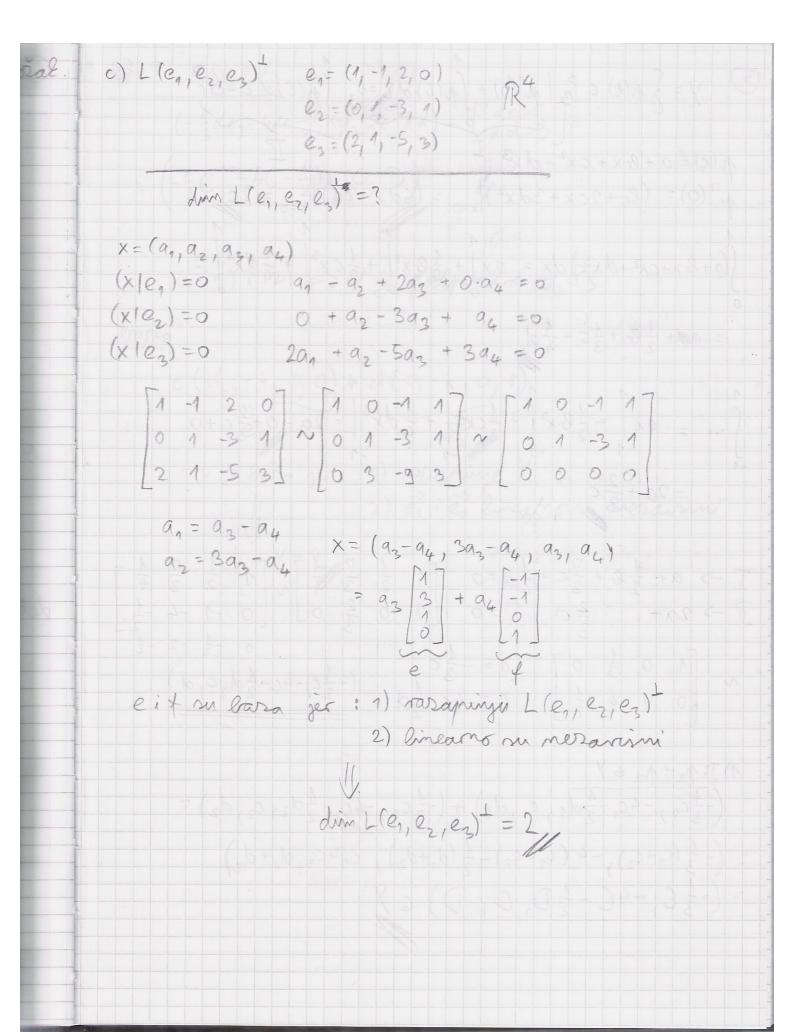
$$5 \cdot 4 \cdot 3 = 3$$

$$7 \cdot 4 \cdot 3 = 3$$

$$7 \cdot 4 \cdot 3 = 3$$

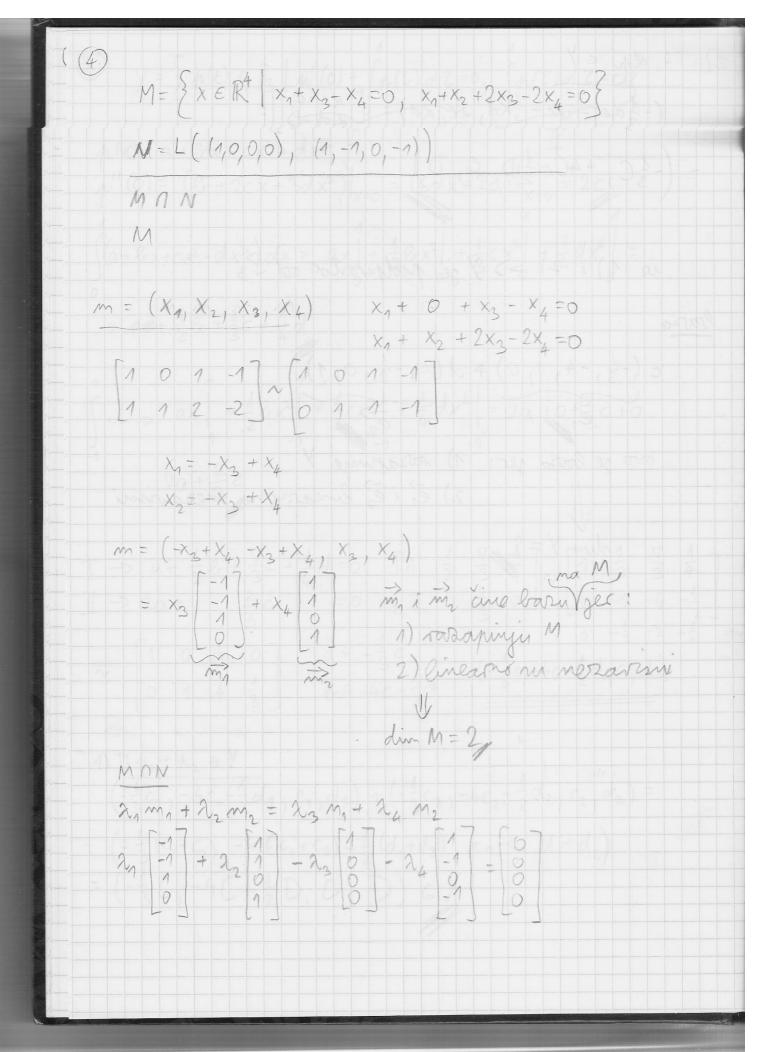
$$8 \cdot 4$$

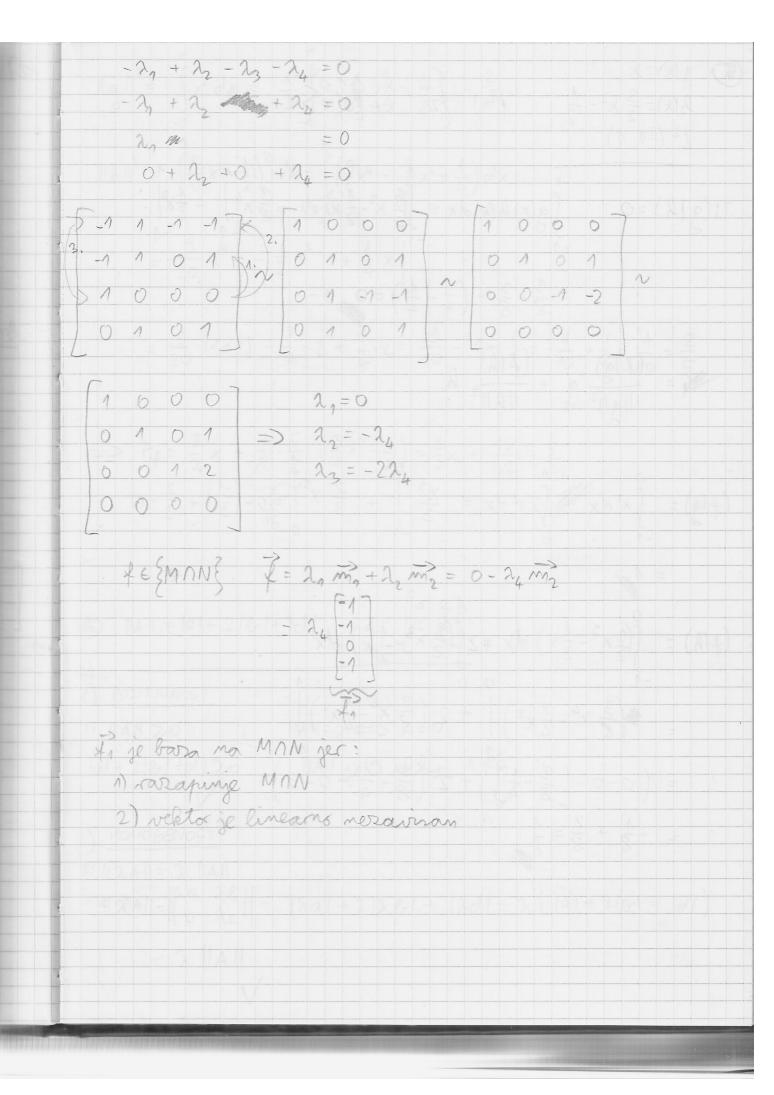
D a) Brostor mad kojim je definiran skalarni umnoral Chalami prodult mad X je;  $(\cdot | \cdot): X \times X \longrightarrow \mathbb{R}$  (ili C) La s. p. vyedi: a)  $(X|X) \ge 0$  i  $(X|X) = 0 \iff X = 0$ e)  $(\lambda x | y) = \lambda (x | y)$ c) (x/y) = (y/x) (ra (: (x/y)=(y/x)) d) (x+y | z) = (x | z) + (y | z) B) T: (X/y) | ≤ 1/x/11/11/11  $x, y \in X$   $t \in \mathbb{R}$   $f: \mathbb{R} \rightarrow \mathbb{R}$ f(t)=(x+yt)x+yt) 70 11x112 + 2(x1y) # 11y11t2 >0 DZO 62-4ac=4(x14)2-411x112114112 60 (x1y)2 & 11x112.11y112/ (x14) & 11 x11.114/1



(23)  $y = \{ p(t) \in P_3 | p''(0) + \{ p(t) | dt = 0 \} \}$  $p(x) = a + b + cx^{2} + dx^{3}$   $p''(0) = (b + 2cx + 3dx^{2})|_{x=0} = (6dx + 2c)|_{x=0} = 2c$  $\int (a+b+cx^2+dx^3)dx = ax + \frac{1}{2}bx^2 + \frac{1}{3}cx^3 + \frac{1}{4}dx^4 =$ = a=+ 1/2 B+1/3 C+1/d  $\int_{100}^{100} = ax \left[ + \frac{1}{2}Gx^2 \right] + \frac{1}{3}Cx^3 + \frac{1}{4}dx^4 = 2a + 0 + \frac{2}{3}C + 0$  $T \rightarrow a + \frac{1}{2}b + \frac{7}{3}c + \frac{1}{4}d = 0 \qquad \begin{bmatrix} 1 & \frac{1}{2} & \frac{7}{3} & \frac{1}{4} \end{bmatrix} \sim \begin{bmatrix} 1 & \frac{1}{2} & \frac{7}{3} & \frac{1}{4} \end{bmatrix}$   $T \rightarrow 2a + \frac{2}{3}c = 0 \qquad \begin{bmatrix} 2 & 0 & \frac{2}{3} & 0 \end{bmatrix} \sim \begin{bmatrix} 1 & \frac{1}{2} & \frac{7}{3} & \frac{1}{4} \end{bmatrix}$ 1) T: p, + p2 & Y  $\left(-\frac{1}{3}c_{1}, -4c_{1}-\frac{1}{2}d_{1}, c_{1}, d_{1}\right) + \left(-\frac{1}{3}c_{2}, -4c_{2}-\frac{1}{2}d_{2}, c_{2}, d_{2}\right) =$ = (-3(c1+c2), -4(c1+c2)-+(d1+d2), c1+c2, d+d2) = (-3C, -4C-2D, C, D) e y

2) T: Lp & Y  $\left(-\frac{1}{3}dc_{3}-4dc-\frac{1}{2}dd, dc, dd\right)=\left[\begin{array}{c} &c=c\\ &d=D\end{array}\right]=$  $=\left(-\frac{1}{3}C, -4C-\frac{1}{2}D, C, D\right)$ is 1) i 2) => Y ge podprotor od 83 basa c (-\frac{1}{3}, -4, 1, 0) + d(0, -\frac{1}{2}, 0, 1) ovo je bara jer: 1) sarapinje Y 2) è i è lineamo nu mesavimi dim Y = 2/1





$$\|g\|^{2} = \int x^{2} dx = \frac{x^{2}}{3} = \frac{1}{4} \cdot \frac{1}{3} - (\frac{1}{3}) = \frac{2}{3}$$

$$\||g||^{2} = \int (\frac{2}{3}x^{2} - \frac{1}{2})^{2} dx = \int (\frac{2}{3}x^{2} - \frac{2}{3}x^{2} + \frac{1}{4}) dx$$

$$= \frac{3}{20} x^{5} - \frac{1}{2}x^{3} + \frac{1}{4}x \Big|_{-1}$$

$$= \frac{2}{20} (1+1) - \frac{1}{2} \cdot 2 + \frac{1}{4} \cdot 2 \cdot \frac{3}{10} - 1 + \frac{1}{2} = \frac{1}{10} + \frac{1}{2} = \frac{1}{10} + \frac{1}{2} = \frac{1}{10}$$

$$= \frac{2}{20} (1+1) - \frac{1}{2} \cdot 2 + \frac{1}{4} \cdot 2 \cdot \frac{3}{10} - 1 + \frac{1}{2} = \frac{1}{10} + \frac{1}{2} = \frac{1$$

#3/7/1X+9/1 6 1/X/1+/14/1 1an+a21+216n+621+1dn+d21 5 1an+A21+2161+21621+1dn+d2 Buduci da vrojedi &m+m < /m + 1m/, nejednatot & vijed e) Ilog men positionote: May Ra matrice oblita a, e, d = 0 i c + o dolize se da je noma matrice 0, ito kosi positismost. (7) a) jergra: skup with vektora van loje vrijedi  $\mathcal{H}(a) = 0$ 1) catroverost ma + a, & E Rer (X). T: A(a)+A(b) = 0+0=04 2) Rationenost na mnorenje sa skalarom a & Res (X) A (da) = / vrijedi homogenort Da lin. op. / = LA (a) = 4.0= Off b) slika: } y & Y | y = A(X) na neti X & X { 2) rationeron ma amon. rand 1) Ratyonenott ma+ ore Im (X) a GE Im (X) a+8= A(a)+A(B)=A(a+B) da= XA(a) = x (Ka)

