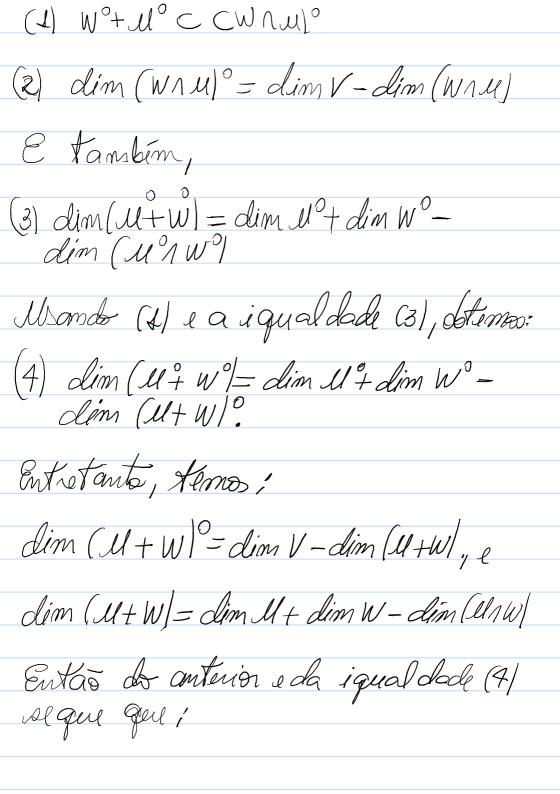
Prova 1 Algebra livia 2 4/1/ Vamos povar que (U+W)=UNW, então UNW° (U+W)° Dado « E (UNW), temos que «(Us)=0 e « (Ws)=0, para todos us E U e $w_{\perp} \in W$. Se $W \in (\mathcal{U} + W)$, entar existem WIEW e UI Ell Kais que w = w1 + ll1, logo: 2 (W) = x(y,+w4)=2 (W4)+2(U1)=0+0=0 l'que implica que «∈ (U+W1. Agora, va mos mostrar que (U+W) E U° NW? Se « ∈ (U+W/, então vale que « (ws+ds)= 0, para todos WIEW & lle Ell. Em particular, tomando UI=0, temos que × (WI)=0, para todo UI EW, o que implica que « E W. Anabagamente, tomando-se UI=0, detenos que

«(U) =0, para todo UL ∈ U. Isso implica que « ∈ U°. E portanto, con clieimos que « ∈ U°n W°. Agra, vamos provor que; $W^2 + U^{\circ} \subset (WN)^{\circ}$ Le «∈ (U+W), então existem«s∈U° e «z∈ W° tais que »= «z+ «z. Fixado w∈ Un, temos que! $\alpha(w) = \alpha_1(u) + \alpha_2(w) = 0$ O que implica que «E(Un W1. Em virta de (Ut W/= U+W, para esta bele cermos o: (Unw)=U+W, Yemos que mos frasi: dim (ll'+W') = dim (ll 1W1° Sabe-se que:



 $dim \{U^{2} + W^{2} = dim U^{2} + dim W^{2} - dim V$ + dim W - dim (U + W)Finalmente, eu ando que: dim 11 = dim V - dim 11 e, dim W = dim V - dim W Assim Kemos que: (5) dim (u+w)=dim V-dim (Unw)

(S) dem (U+W)=dem V-dim(UNW)

Dows iqual dades (2) e(S), concluionos

que;

dim (4°+4°) = dim (11+41°

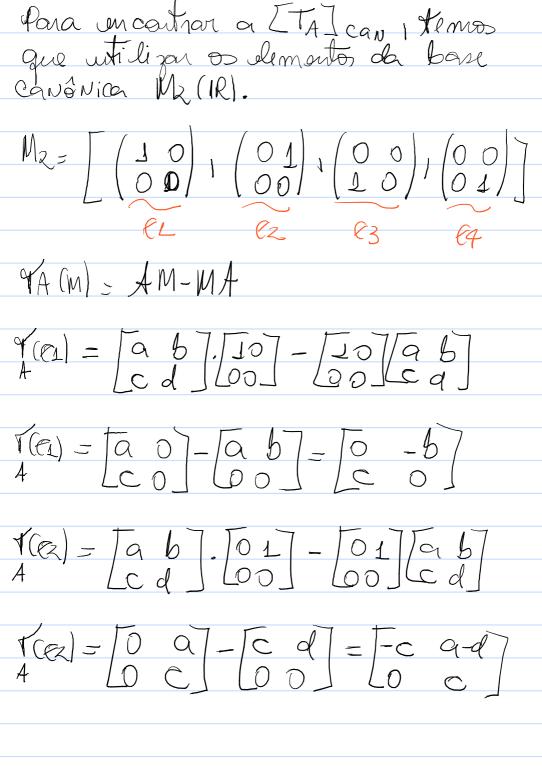


2) A = [a b], TA i um operador Led] livear. Temos que YA(M) = AM-MA. Temos que um operador livear é uma L'aux formação T: V-DV, então pora mostrar que VA á livear. TA (MI + Ma) = LT(MI) + TA(Ma), VIER Q MI, ME EV Temos que mostrar qui o fuvciorais liveaux dista iqual dade osiv cidem em oda vetor VEV, isto i: T (M1 + M2) (V) = (M2+M2) (TACVI) =

$$Y(|M_1 + M_2|(v) = (|M_2 + M_2|(T_A cv)) =$$

$$|M_1(T_A(v)) + M_2(T_1(v)) = |T_1(M_1|(v) + T_1(M_2|(v)) =$$

$$|T_1(M_1) + T_2(M_2)|(v)$$

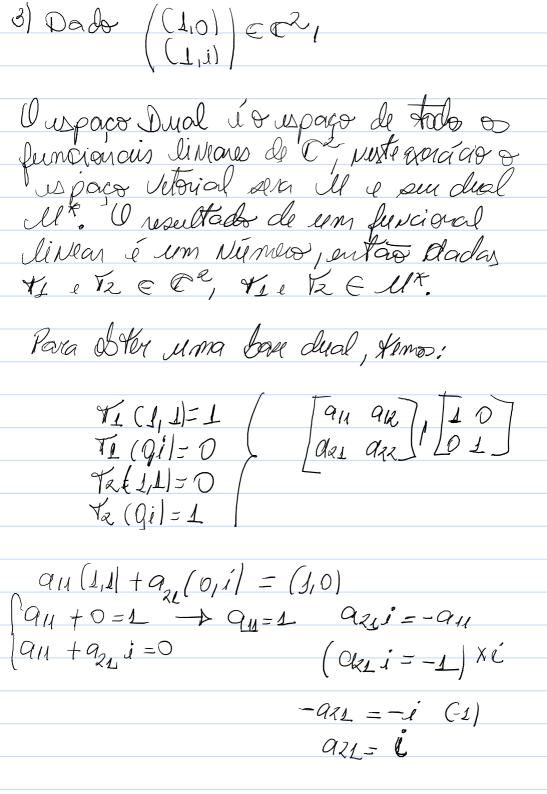


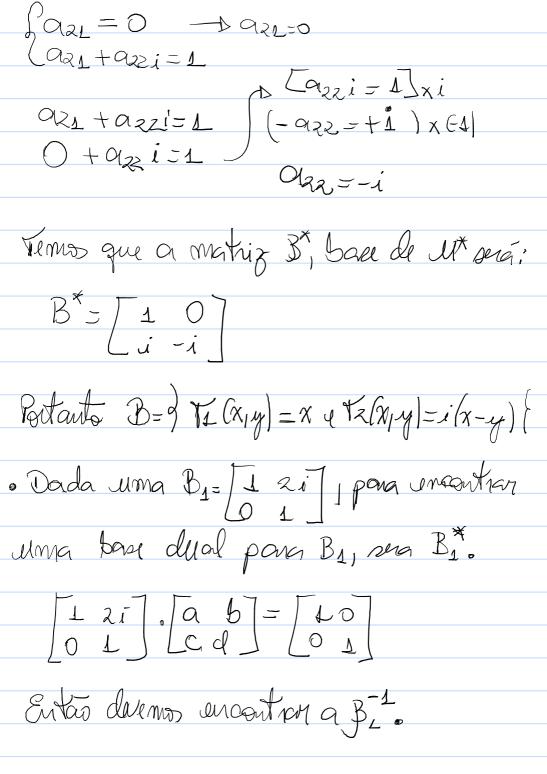
$$T_{A}(e_{3}) = \begin{bmatrix} a & b \\ c & d \end{bmatrix} \begin{pmatrix} 0 & 0 \\ 1 & 0 \end{pmatrix} - \begin{pmatrix} 0 & 0 \\ 2 & 0 \end{pmatrix} \begin{pmatrix} a & b \\ c & d \end{pmatrix}$$

$$T_{A}(e_{3}) = \begin{bmatrix} b & 0 \\ d & 0 \end{bmatrix} - \begin{bmatrix} 0 & 0 \\ a & b \end{bmatrix} = \begin{bmatrix} b & 0 \\ d & a - b \end{bmatrix}$$

$$T_{A}(e_{4}) = \begin{bmatrix} a & b \\ c & d \end{bmatrix} \begin{pmatrix} 0 & 0 \\ 0 & 1 \end{pmatrix} - \begin{bmatrix} 0 & 0 \\ c & d \end{bmatrix} = \begin{bmatrix} 0 & b \\ c & d \end{bmatrix}$$

$$Ent_{ab} = \begin{bmatrix} a & b \\ c & d \end{bmatrix} \begin{bmatrix} c_{a} & c_{a} & c_{b} \\ c_{a} & c_{a} & c_{a} \end{bmatrix} = \begin{bmatrix} c_{a} & c_{a} & c_{a} \\ c_{a} & c_{a} & c_{a} \end{bmatrix} = \begin{bmatrix} c_{a} & c_{a} & c_{a} \\ c_{a} & c_{a} & c_{a} \end{bmatrix} = \begin{bmatrix} c_{a} & c_{a} & c_{a} \\ c_{a} & c_{a} & c_{a} \end{bmatrix} = \begin{bmatrix} c_{a} & c_{a} & c_{a} \\ c_{a} & c_{a} & c_{a} \end{bmatrix} = \begin{bmatrix} c_{a} & c_{a} & c_{a} \\ c_{a} & c_{a} & c_{a} \end{bmatrix} = \begin{bmatrix} c_{a} & c_{a} & c_{a} \\ c_{a} & c_{a} & c_{a} \end{bmatrix} = \begin{bmatrix} c_{a} & c_{a} & c_{a} \\ c_{a} & c_{a} & c_{a} \end{bmatrix} = \begin{bmatrix} c_{a} & c_{a} & c_{a} \\ c_{a} & c_{a} & c_{a} \end{bmatrix} = \begin{bmatrix} c_{a} & c_{a} & c_{a} \\ c_{a} & c_{a} & c_{a} \end{bmatrix} = \begin{bmatrix} c_{a} & c_{a} & c_{a} \\ c_{a} & c_{a} & c_{a} \end{bmatrix} = \begin{bmatrix} c_{a} & c_{a} & c_{a} \\ c_{a} & c_{a} & c_{a} \end{bmatrix} = \begin{bmatrix} c_{a} & c_{a} & c_{a} \\ c_{a} & c_{a} & c_{a} \end{bmatrix} = \begin{bmatrix} c_{a} & c_{a} & c_{a} \\ c_{a} & c_{a} & c_{a} \end{bmatrix} = \begin{bmatrix} c_{a} & c_{a} & c_{a} \\ c_{a} & c_{a} & c_{a} \end{bmatrix} = \begin{bmatrix} c_{a} & c_{a} & c_{a} \\ c_{a} & c_{a} & c_{a} \end{bmatrix} = \begin{bmatrix} c_{a} & c_{a} & c_{a} \\ c_{a} & c_{a} & c_{a} \end{bmatrix} = \begin{bmatrix} c_{a} & c_{a} & c_{a} \\ c_{a} & c_{a} & c_{a} \end{bmatrix} = \begin{bmatrix} c_{a} & c_{a} & c_{a} \\ c_{a} & c_{a} & c_{a} \end{bmatrix} = \begin{bmatrix} c_{a} & c_{a} & c_{a} \\ c_{a} & c_{a} & c_{a} \end{bmatrix} = \begin{bmatrix} c_{a} & c_{a} & c_{a} \\ c_{a} & c_{a} & c_{a} \end{bmatrix} = \begin{bmatrix} c_{a} & c_{a} & c_{a} \\ c_{a} & c_{a} & c_{a} \end{bmatrix} = \begin{bmatrix} c_{a} & c_{a} & c_{a} \\ c_{a} & c_{a} & c_{a} \end{bmatrix} = \begin{bmatrix} c_{a} & c_{a} & c_{a} \\ c_{a} & c_{a} & c_{a} \end{bmatrix} = \begin{bmatrix} c_{a} & c_{a} & c_{a} \\ c_{a} & c_{a} & c_{a} \end{bmatrix} = \begin{bmatrix} c_{a} & c_{a} & c_{a} \\ c_{a} & c_{a} & c_{a} \end{bmatrix} = \begin{bmatrix} c_{a} & c_{a} & c_{a} \\ c_{a} & c_{a} & c_{a} \end{bmatrix} = \begin{bmatrix} c_{a} & c_{a} & c_{a} \\ c_{a} & c_{a} & c_{a} \end{bmatrix} = \begin{bmatrix} c_{a} & c_{a} & c_{a} \\ c_{a} & c_{a} & c_{a} \end{bmatrix} = \begin{bmatrix} c_{a} & c_{a} & c_{a} \\ c_{a} & c_{a} & c_{a} \end{bmatrix} = \begin{bmatrix} c_{a} & c_{a} & c_{a} \\ c_{a} & c_{a} & c_{a} \end{bmatrix} = \begin{bmatrix} c_{a} & c_{a} & c_{a} \\ c_{a} & c_{a} & c_{a} \end{bmatrix} = \begin{bmatrix} c_{a} & c_{a} & c_{a} \\ c_{a} & c_{a} & c_{a} \end{bmatrix} = \begin{bmatrix} c_{a} & c_{a} & c_{a} \\ c_{a} & c_$$





 $\alpha + 2ib = 1$

c+21d=0

$$\mathcal{B}_{\perp}^* = \left\{ \left(\Delta_1 - 2i \right), \left(O_1 L \right) \right\}$$