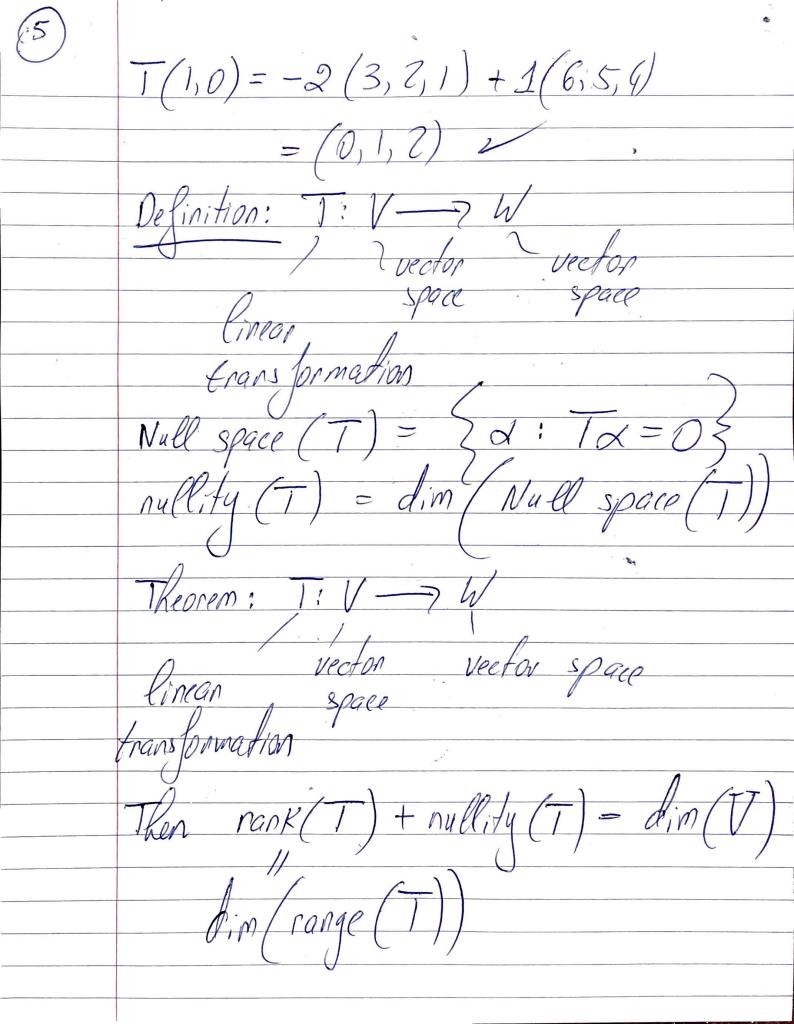


(3)	
	Proof: Given de V]! n-tuple
	$(X_1, X_2, \dots, X_n) \ni$
э	$\mathcal{I}_{\mathcal{A}} = \chi_{1} \beta_{1} + \dots + \chi_{n} \beta_{n}$
	well-defined rule, but is it linear?
	Let B= y,d, + ,, + yodo EV, c=scalar
	CX+B=(CX,+4,)x,+111 + (CXn+4,)xn, 50
	$T(cz+\beta)=(cx_1+y_1)\beta_1+\dots+(cx_n+y_n)\beta_n.$
, , , , , , , , , , , , , , , , , , , ,	
	$C(\overline{I}_{\lambda}) + \overline{I}_{\beta} = e \sum_{i=1}^{n} x_i \beta_i + \sum_{j=1}^{n} y_j \beta_i$
	\wedge
	= 2 (cx; +y;) B;, so
	$T(cd+\beta)=cTd+T\beta.$
	this gives us existence,
	. 0

Uniqueness:
$$Tf(UJ_s = \beta_s)$$
 $J = 1, 2, ..., n$
 $J = 1, 2, ...,$



T: R= 7 R (α_1, α_2) ditdz coordinates $Id = 0 c \rightarrow d_2 = -d_1$, so Null space (T) = \(\frac{1}{2} \) = \(\frac{1}{2} \) = \(\frac{1}{2} \) = \(\frac{1}{2} \) nullity (1)=1 rank(T) = 1pank nullity dim(V)= dim (IR?)

Proof of Rank-Nullity theorem: N= Null space of P di, dz, m, dx & Casis of N Extend to basis of T by

3 di, dr, m, dk, dun, m, dn 3 Claim: Glaxer, Jan ? Casis A Range They centainly span since

1d; = 0 12; = K. Independence: Suppose $\sum_{i=1}^{n} C_{i} \cdot I \times i$

Then $\int_{i=k+1}^{n} C_i d_i = 0$ $C \rightarrow d = 2 c_i d_i \in N$ () B_1 = ... B_K = C_K+1 = ... C_n = 0 Let r= rank (T).

It follows that r=n-k

and we are done,