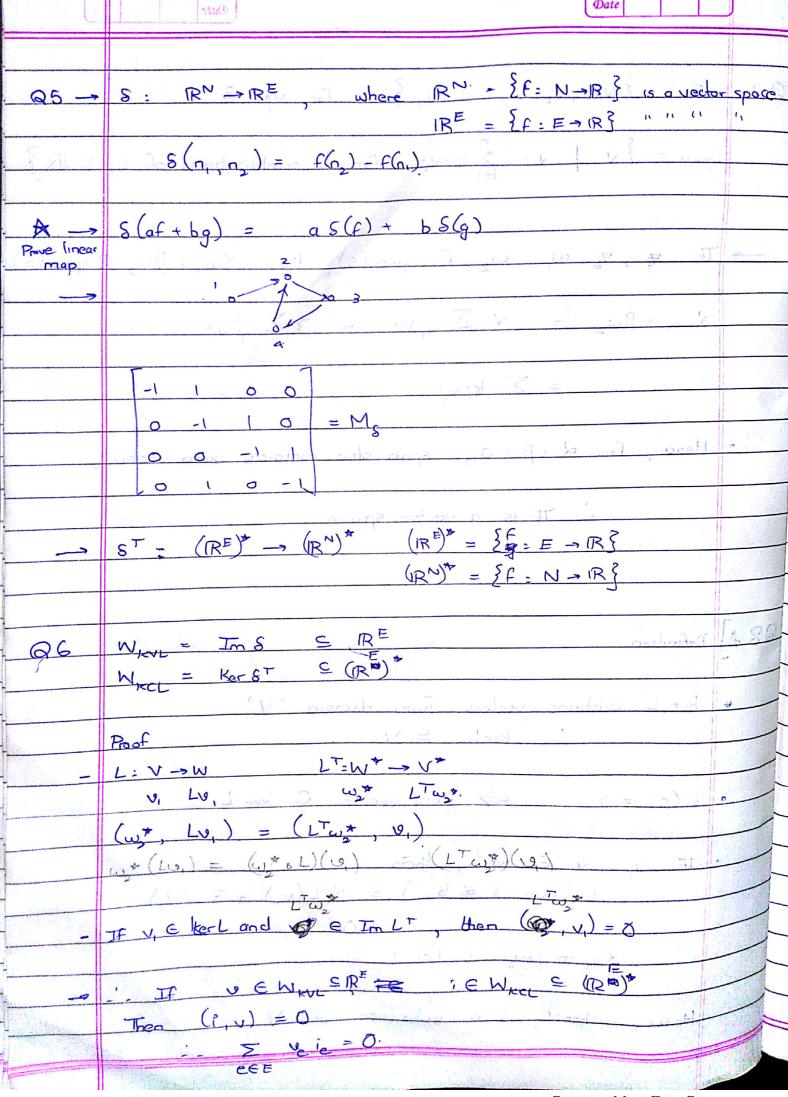
	HOMEWORK 5
	Tarren ella de la companya della companya della companya de la companya della com
12	Définé a mapping L : V -> V**.
Q3	such that $L_{\alpha}(f) = f(\alpha) \forall f \in V^*$
	I the house of a vicini in 3
	TPT:- Incar and and day
	Consider of BEV and C, CEE
	Let 8 = C, d + C, B
	$L(Y) = L(c_1 d + c_1 B)$
	= f(c, x + c, B)
	$= c_1f(x) + c_2f(B)$
	$= c L(x) + c L(\beta)$
	= C ICA) + C C(P)
	Lis non-singular: $L(x) = 0$ iff $x < 0$.
-	Lis non-singular :- [(a) = 0 101 2 101
	Since. The dim V = dim V** (=dim V*) and L is non-singular,
	Since. Lis invertible
	Lis invertible
	Hence L defines an isomorphism.
	Hence L defines an Gamara
1.12	
	$(1:1) \rightarrow V \in (1, V)$
94.	(0.11)
	L2: U>V € 11 (U,V)
	$(1 \ 1)(1 \ tu) = L_1(u_1 t_1u_2) + L_2(u_1 t_1u_2)$
->	$\frac{(L_1 + L_2)(u_1 + cu_2)}{c(L_1 + L_2)(u_1) + c(L_2)(u_1) + c(L_2)(u_2)} = \frac{L_1(u_1 + c(u_1) + c(L_2)(u_1) + c(L_2)(u_2)}{c(L_1 + L_2)(u_1) + c(L_2)(u_2)}$
	$=c(L_1+L_2)(u_1)+c(L_1+L_2)(u_2)$
	$\frac{1}{2} \frac{1}{2} \frac{1}$
	Zero mapping: $= c_1(0) + c_2(0)$
	= 0
	Inverse mapping: [f+(-f)]u = f(u)+(-f)(u) = f(u) + f(-u)
	Inverse mapping = f(u) + f(-u)
	= f(u-u) $= f(0) = 0$
	= f(0) = 0



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Q7	5 = { V, V, V, Vn } for V; E V.	26
	Spon = { V V = \frac{1}{i=1} Civi for all combinations of c	· EIR}
	100 100 100 100 100 100 100 100 100 100	4
	IF \$ \$\pm\ \w_1\ , \omega_2\ \in \span\(s) then \dw, + \betaw_2\	Espan(S)
	$d\omega_1 + \beta\omega_2 = d\sum_i c_i v_i$	
	= \(\frac{1}{2} \\ \	
	Hence, for d = B = 0, span also contains zero vector	
	It is a vector space	
	THE SA Vector Space	-
1	381 - 11 - 1490	
981	7 Definition	38
	1 M = Kar ST & (20)	
	· ker L contains vectors from domain 'V'	
	: KerL S V	
	L. N M. C. M M M M M M	
	· L(0) = 6 ⇒ Zero vector € ker L	
1	La to the total	
	· IF V, V E ker L, then	
	$L\left(d_{V_1} + \overline{B}BV_2\right) = \alpha L(v_1) + BL(v_2)$	
1	1 = 10 · 1 · 10 · 10 · 10 · 10 · 10 · 10	-
1	· dy + By E ker L	
1	The same of the sa	S\$4
1	Hence, ker L is a subspace of V.	

в7	Definition (1)	¥1
7		
•	im L takes vectors in W.	
	int E W	1.17
	e to tour to it of of the	
•	There exists zero vector in im L, corresponding to zero	vector
	If v, v E imb, having praimages 4, and 42 in	
	then. C, V, + C, V & int preimage C, U, + C, L(U2) L(C, U, + C, U2) = C, L(U1) + C, L(U2)	1/0
	= C, V/ 1+ C, V - (A) +01	LA
2		
	Hence dimpolis at subspace of W. goods whom with	
	and the of govied and have W. F. IV. N. and of a	
29	W+ 25 lov* and bas ab a last to sales and	
	W' = { w, * e, v* (w, w,) = 0 by w, e W	3
and the second s	W 3 VA VA	
QIB	$L: V \rightarrow W$ $L^T: W^* \rightarrow V^*$	
	V, JLV, W,	
	$(\omega_2^*, L_{\nu_1}) = \omega_2^* [L(\nu_1)]^2 = (\omega_2^* \circ L) v_1 = [L^T(\omega_2^*)]$	(4)
	= (LTw*	
	To care and at a company some action dullance and a	VII
	Now, y E ker L and y* E Im LT	-
	Here $V_2^* \in \mathbb{F} = L^{\top}(\omega_2^*)$	
	P-T-a.	

V		
	$(v_2^*, v_1) = (L^T \omega_2^*, v_1) = (\omega_2^*, L_{19_1}) = (\omega_2^*, v_1)$	S 3
	$\mathcal{L}_{\mathcal{L}}}}}}}}}}$)
The state of the s	W m salute a mi	The State of Basiners National State of the State of Page 1
}	1N 9 1 m	
-	((\(\frac{1}{2}, \frac{1}{2} \) = 0 for all such \(\frac{1}{2}, \frac{1}{2} \), \(\frac{1}{2}, \frac{1}{2} \),	W. Carlot
Jan Lany	There exists some and a relative real	THE PROPERTY OF THE PROPERTY O
	$\frac{1}{2} \left(\frac{1}{2} - \frac{1}{2} \right)^{\frac{1}{2}} = \frac{1}{2} \ln L^{\frac{1}{2}}$	
	(Mer L) = Im L	
	IT N N N C 100 house presented and I N N IT	ō.
	STATE SOURCE Clay Inc. of Vista Vis and	
911	Let W = Q Up where Up are vector spaces co	
A	Let by - Oliver	1
J .	where Up are vector spaces co	potarong
13		
•	Zero vector belongs to all U; > TE belongs to W!	
	Vectors V, V2 EW must also belong to all Up	
	J	
	For scalars of and By and By as well as	200
	de la	1, (3)
	dy, + By belong to all "U.	
^		
	· dv, + Bv2 EW	
	*V==*W . T. \ W= V = JE	A 1 (2)
	· W is a vector space *	
7	1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2	
-B]	All vectors up in 5 = {v;} belong to W.	4
	Hence all linear combinations & Civi belong to W	CP GIR)
	V	<i></i>
	The smallest vector space containing 5 is the span of	C
	the singlest	
	W must be the span of S.	