Assignment -7.

$$L(v) = e^{V}$$

We need to Show
$$L(xV_1 + \beta V_2) = \chi L(V_1) + \beta L(V_2)$$

$$L(xV_1 + \beta V_2) = e^{(xV_1 + \beta V_2)}$$

$$= (e^{\vee_1})^{\alpha} \cdot (e^{\vee_2})^{\beta}$$

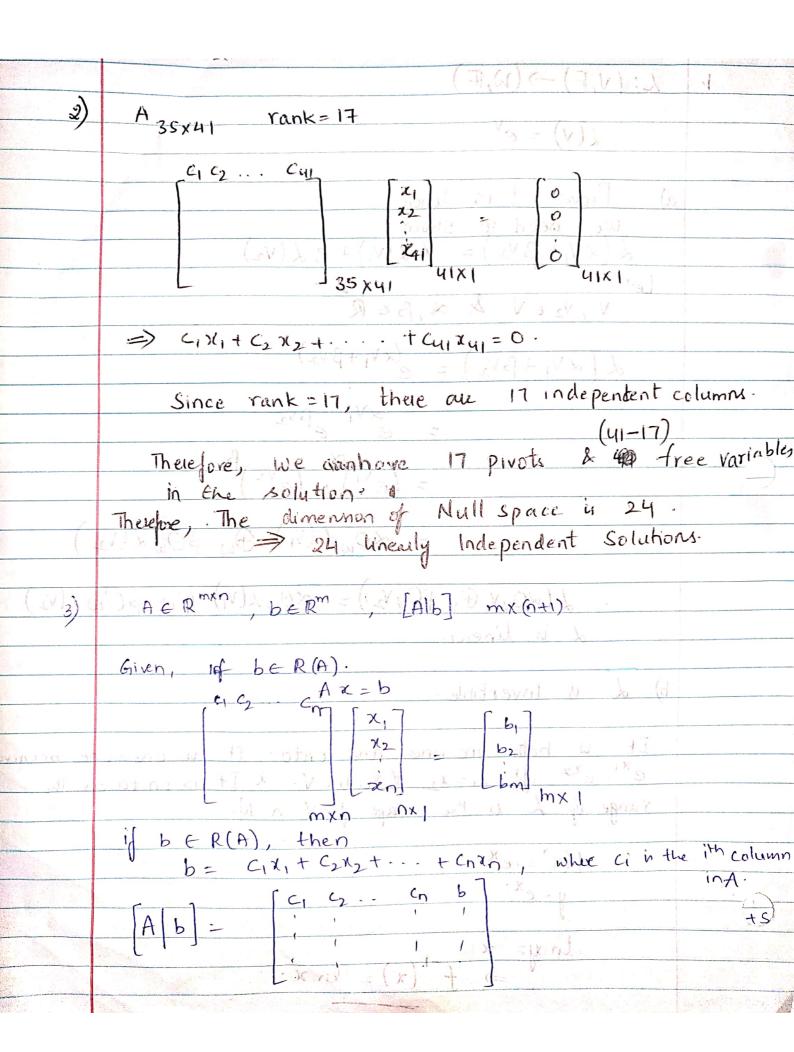
=
$$< O_{\omega} \angle (V_1) \oplus_{\omega} \beta O_{\omega} \angle (V_2)$$

L is linear.

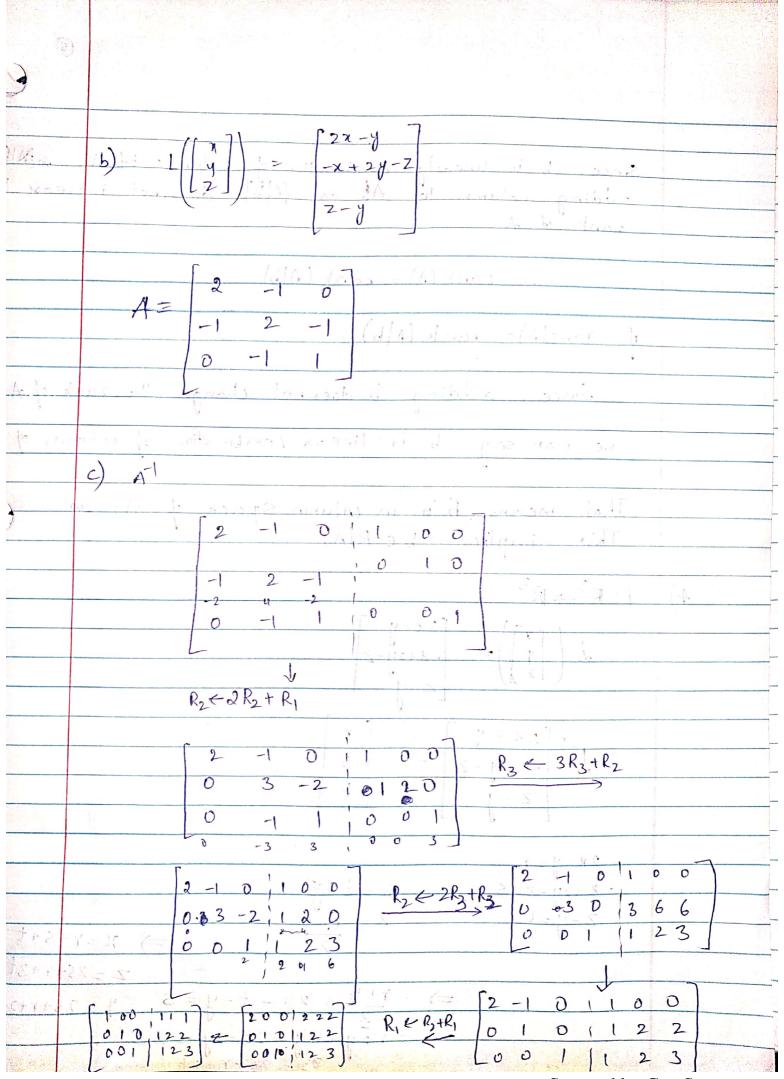
It is both one-one and onto. It is one-one because exi=ex2 iff x,=x, +x, x, EV. & It is on-to as the

range of L is the image of Vin W.

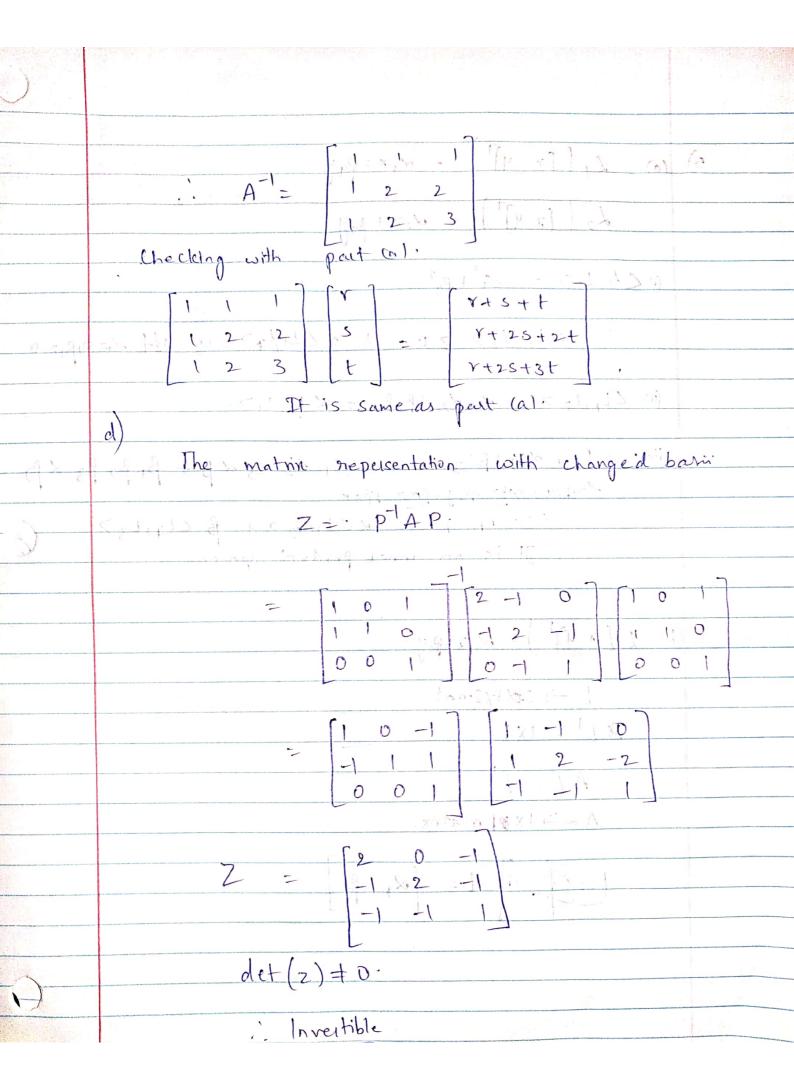
$$f(x) = e^{x}$$

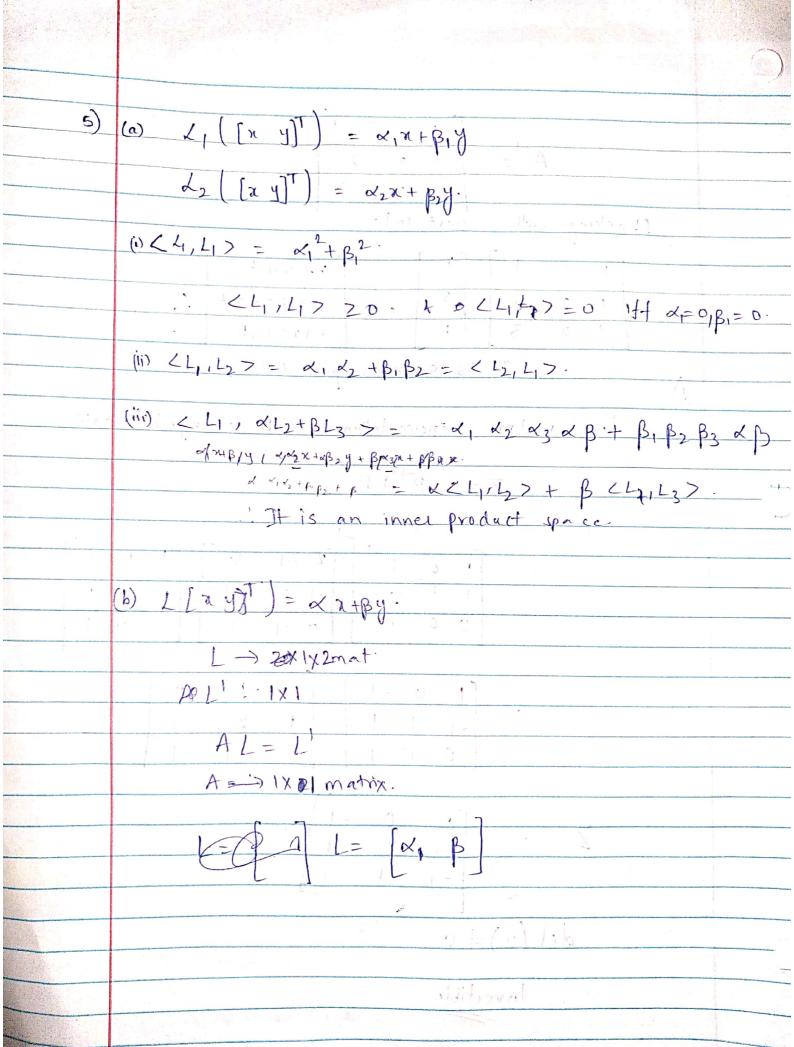


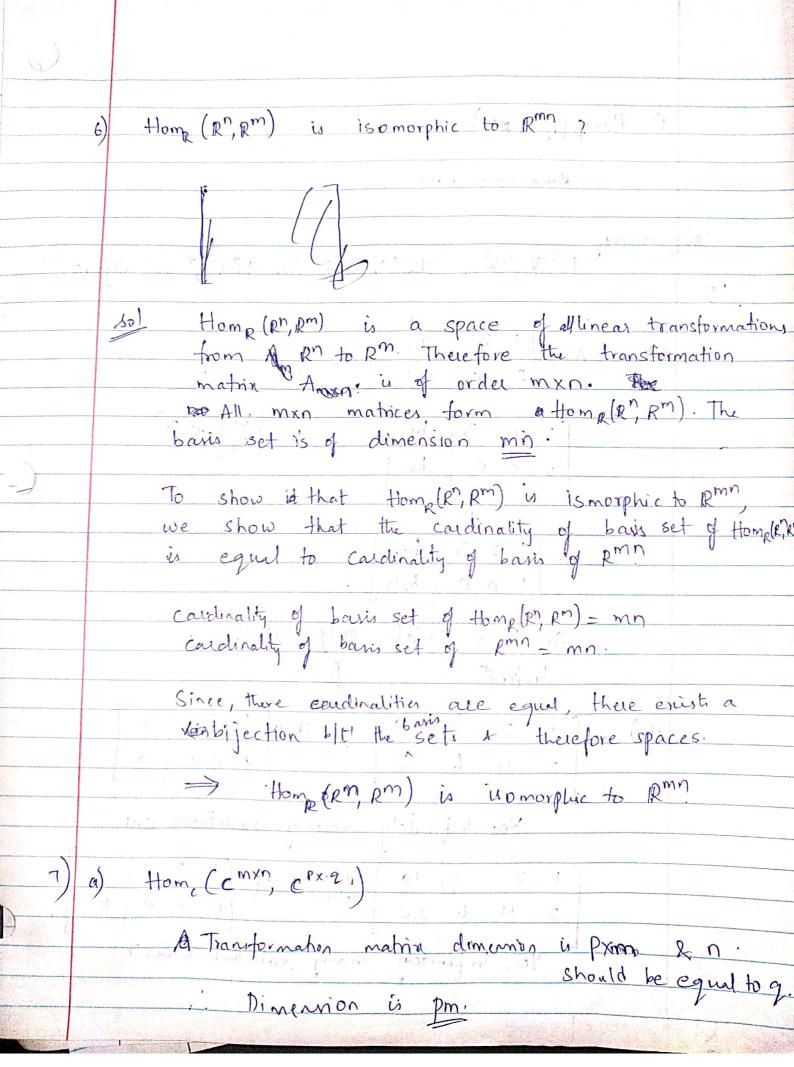
	Since, b is linearly combination of columns of A, which adding column to Ab as [A]b] do esnot increase the rank of A.
	.: rank (A) = rank (Alb)
	if $rank(A) = rank(A b)$
	Since, adding b does not change the rank of A,
	we can say b is linear combination of columns of A.
2	Il in in column Space of A. in
	That means bis in column space of A. of This implies be R(A).
4)	$L: \mathbb{R}^3 \to \mathbb{R}^3$
	$ \begin{bmatrix} -1 & 2x - y \\ -x + 2y - z \end{bmatrix} = \begin{bmatrix} 5 \\ 2 - y \end{bmatrix} $
	2 X - Y - Y
()	-x+2y-z=S $=Z=t+y$
	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$
1 5 -	$\frac{Z-y=t}{2} \qquad \frac{\chi-\gamma+y}{2} \qquad \Rightarrow \chi=\gamma+s+t}{Z=2s+\gamma+3t}$
	-) - r+y + 24 - t-4 = 8 4-2C+r+2+.
	3 4 5 4 2 5 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6
	S - rey + 44 - 2t - 2y - 2 s -

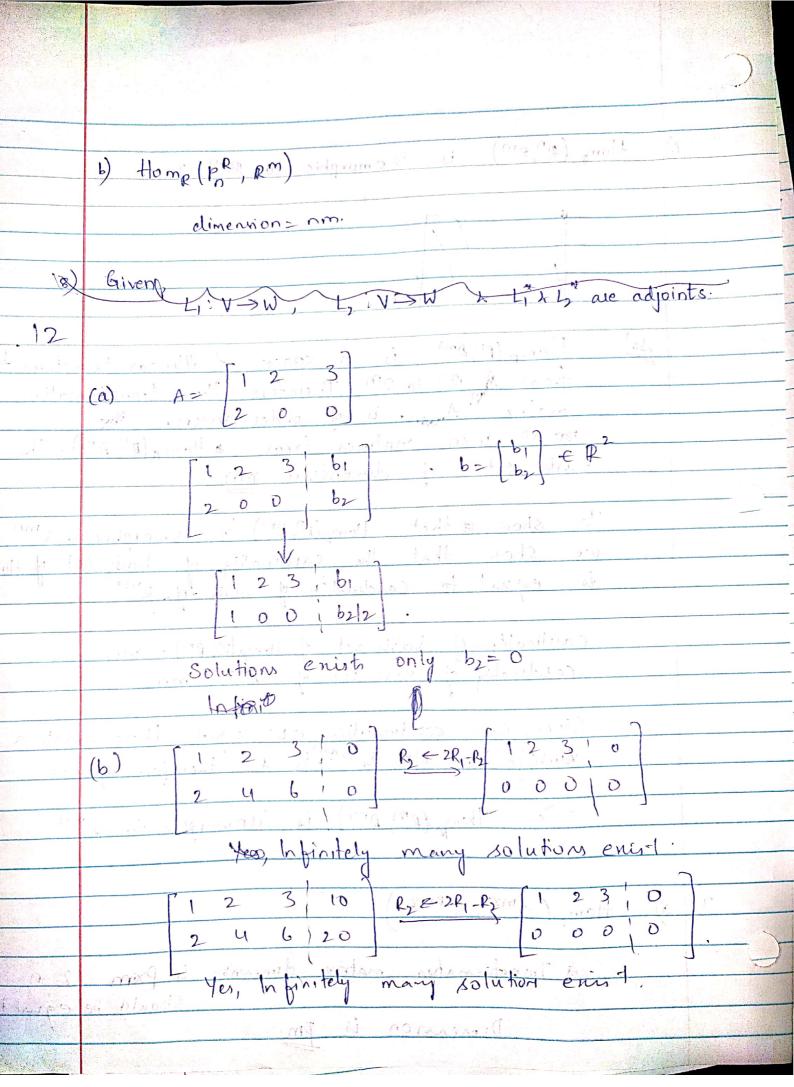


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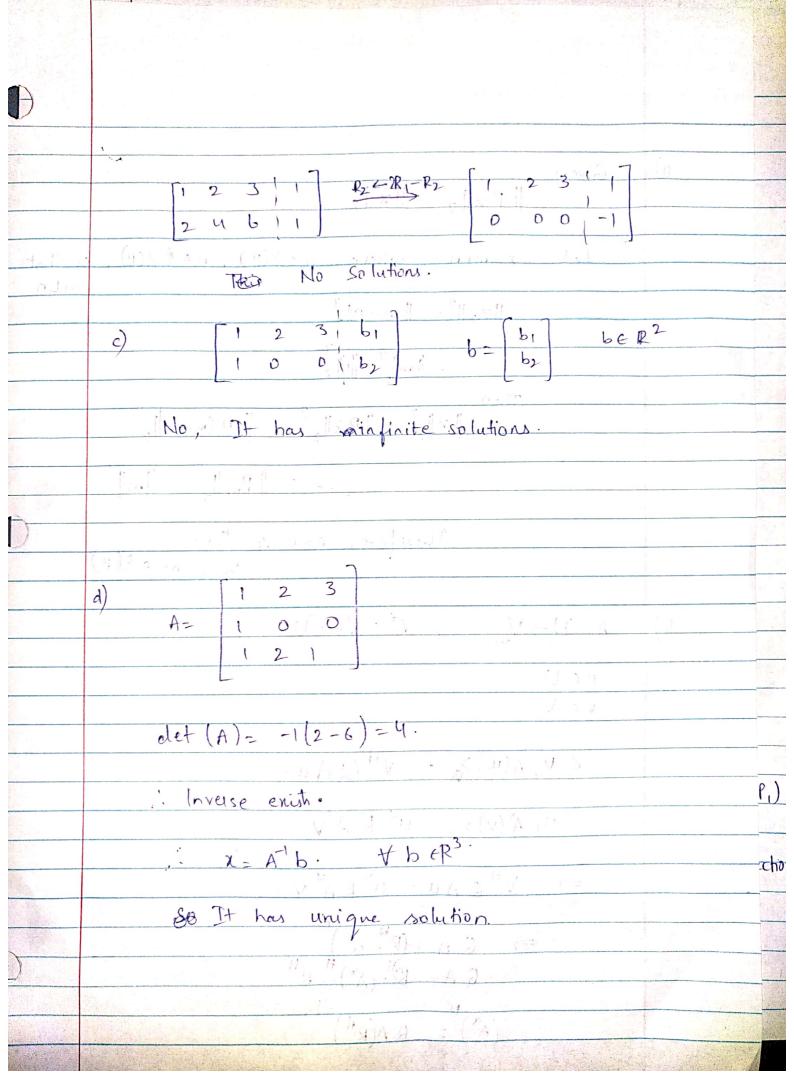






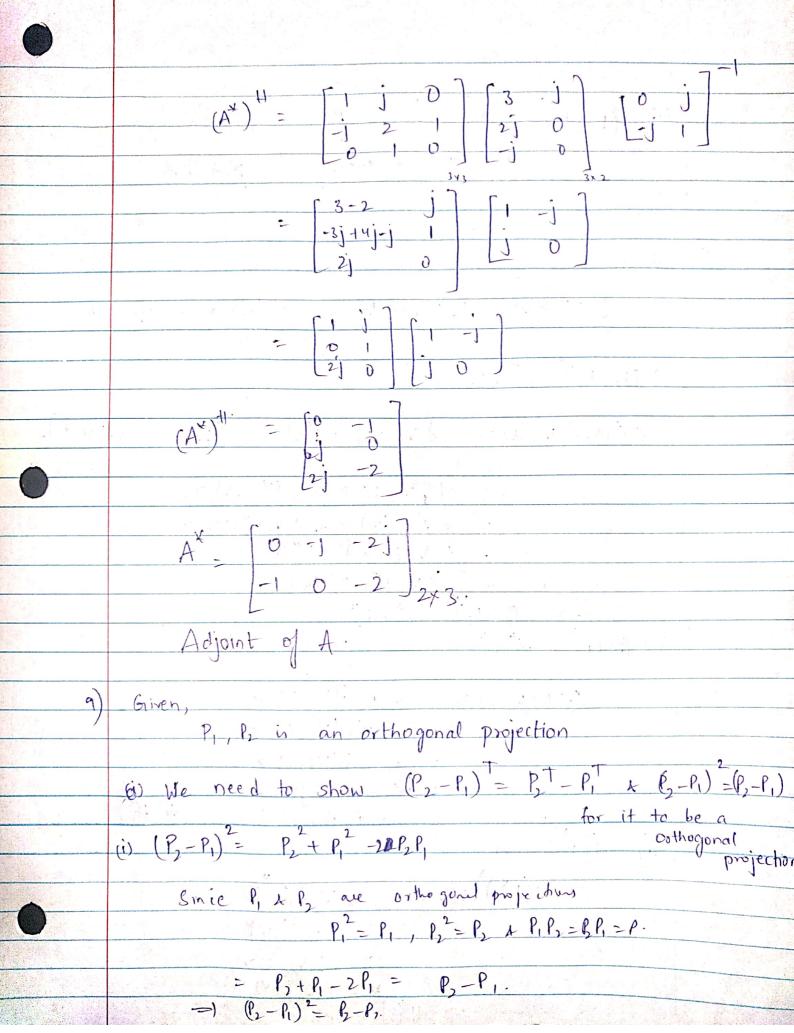


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u)	Given $\ Px\ _2 = \ x\ _2$	
	let x=m+n, where meR(P), ne(R(P), s	o that
		mln
	$-\ x_2\ ^2 = \ m+n\ _2$	
	$-\ x_2\ ^2 = \ m+p\ _2^2$ $= \ m\ _2^2 + \ n\ _2^2$	
	Then Then	
	$= P_m _2^2 = m ^2$	
	57 1 . H	
	Therefore, n=0 & thus N=m ER(P)	
	(h	
10)	$A: \mathcal{V} \rightarrow \mathcal{V}$ $S \times 2$ $S \times 1$ $A^*: \mathcal{V} \rightarrow \mathcal{V}$	
No.	uev	
	VEV	
	P=(0-0)1- 0(A) 110	
	<v, a(u)=""> = VHQAu.</v,>	~
	$\langle u, A^*(v) \rangle = u^{\dagger} R A^* v$	
	=) VHQAu=uHRA*V.	
	in the main and the	100
	\Rightarrow QA = (R, A, A,)	
	$\Rightarrow Q A = (R^{*}, A^{*})$ $Q A = Q^{H}, (A^{*})^{H}, Q^{H}$	
	$(A^*) = Q A(R^H)^{-1}.$	The state of the s
	(A) = QA(K)	And the last of th



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