1	Towney going CS 20 BT ECH 11063
	TOPIC Comex Assignment 1 DATE
1	A) C is not a substace
	S= 5 (0,0)3 (0>0)
	2x120 . x120
	n26R
	if a < 0 then n, = 0, n2 eTR C is not substitute for any S
	C is not substance for any S
	B) C is not an affine set
	$S = \mathcal{L}(1, D)^{\frac{1}{2}}$
· ·	the fart where no wordinate
	20 doesn't lie in C
	The office
	() Let us take Q, U & C
	ery >0 & bty >0 +yes
	0 at 4 >0 , (1-0) et 1 >0 tyes + 8 & CO.1]
	(00 + (1-0) 1) 4 = 00 Ty + (1-0) 1 Ty 20
	80 + C1-0) L & C
	Cil ronner
	D) let o e C
	QTy>0 tyes
Total Control	Daty 20 tyes + 8 > 1  Oa G C
	· · · C is a some
	a cone
0.	

	TOPIC DATE
2	TOPIC DATE
2.	To frame: f. is connex
	Proof
	ine already know that f(n) = 1/21/2 is
	corres for
	0110112 + (1-0)11 10112 > 11 0 0 + (1-0) 101 40 E1
	(from bringle inqual
	y-An is an affire transformation of
	composition of normer for is also is
	11 y-Anll is also conver
	7- DA
	To ferous: f2 & normer
	Plias :  f(2) = 1/21/2
	1/ 0/ - (2/)
	if
	- f(M)= m,2+-+ xn2
	$\nabla^2 f(z) = 2 \Gamma$
	2 this is the serie definite here.
	il contex
	Affline make of some for are also
	Affine make of somes for are also somes
1,	$f_2(3) =   y  ^2 - 2yAx + n^TA^TAx$ $\frac{\partial f_2(x)}{\partial x} = -2yA + n^TA^TA + A^TAx = -2yA + 2A^TA$
	$\partial f_2(x) = -2yA + x^T A^T A + A^T A x = -2yA + 2A^T A$
	3 %
	d2f2(2) = 2ATA (+ve semi definite)
N .	4×2
3.	A) (111)
	conve hall = Z & xi
	0.00.21 4.
	201-1

	TOPICDATE
	8) To prove: f( M) = mark f(21), f(22), , f(2m) }
	proof:
	Proof: Let us take some $x = \sum x_i x_i$ ( $\sum x_i = 1$ ) ( $x_i \in Lou3$ )
	( xie Louis)
	f(n) is a conven for
	$\leq \sum_{i=1}^{\infty} (x_i)$ $\leq (\sum_{i=1}^{\infty} (x_i)^2)$ $= \max_{i=1}^{\infty} (x_i)^2$
	= (5 xi) max 4 f(xi) g
	= max 4 f(x;)3
	;=1
	Herre Braved
	The property
-	
	70 Rrone: C, 1C2 are souver & C,=C2
4	10 prove: C1 162 are
	Proof: C1= 5 (A12): AES, ZER, /A b > 0? Proof:
3112	CI= 7 (AIZ) · HES , ZEIN, I = I J
7-	let us take (A1, Z1) & C
	(A2, 22) & C
	Transfer to the state of the st
	$\begin{array}{c c} & \mathcal{Z}^{T} \left( \begin{array}{c} A_1 & \underline{\sigma} \\ \underline{\sigma} \end{array} \right) & \mathcal{Z} = 0 \\ & & & & & & & & & & & & & & & & & \\ & & & & & & & & & & & & & \\ & & & & & & & & & & & & & \\ & & & & & & & & & & & & \\ & & & & & & & & & & & \\ & & & & & & & & & & \\ & & & & & & & & & & \\ & & & & & & & & & \\ & & & & & & & & & \\ & & & & & & & & & \\ & & & & & & & & \\ & & & & & & & & \\ & & & & & & & \\ & & & & & & & \\ & & & & & & & \\ & & & & & & & \\ & & & & & & \\ & & & & & & \\ & & & & & & \\ & & & & & & \\ & & & & & & \\ & & & & & & \\ & & & & & & \\ & & & & & & \\ & & & & & & \\ & & & & & & \\ & & & & & & \\ & & & & & & \\ & & & & & & \\ & & & & & & \\ & & & & & & \\ & & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & \\ & & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & \\ & & & \\ & \\ & & \\ & & \\ & & \\ & \\ & \\ & & \\ & \\ & \\ & \\ & & \\ \\ & \\ & \\ & \\ & \\ & \\ & \\ & \\ & \\ & \\ & \\ & \\ & \\ & \\ & \\ & \\$
	similarly nt A2 b N 2 0
= 1	
	2 ( 0 (A, b) + (1-8) (A2 & ) x >0
	2 21
	$\frac{\partial \left(A_1  \underline{\nu}\right)}{\left(\underline{\nu}^{\intercal}  Z_1\right)} + \left(1 - \underline{0}\right) \left(A_2  \underline{\nu}\right) > 0$
	( b' z <sub>1</sub> ) ( b' z <sub>2</sub> )

C. H RAPINGE  My the somidificate if $A > 0$ (A, Z) $\in C_1$ $\in (A_1 Z) \in C_2$ $\forall (A_1 Z)$ C. $C_1 = C_2$ C. H RAPINGE  C. H RAPINGE  C. H RAPINGE  Sco) Given: $f(X)$ $\psi$ represents consider the speak proof: let us take $x = (n_1)$ be the often value if $x \in C$ We know that $f((x_1, n_2)) = f((x_2, n_1))$ Value if $x \in C$ We know that $f((x_1, n_2)) = f((x_2, n_1))$ Let us take a faint on the line joining $x \in C$ $f(x_1) = f(x_2)$ $f(x_1) = f(x_2)$ Let $f(x_1) = f(x_2)$ Let $f(x_1) = f(x_2)$ Let $f(x_1) = f(x_2)$ Let $f(x_1) = f(x_2)$ $f(x_1) = f(x_2)$ $f(x_1) = f(x_2)$ $f(x_2) = f(x_3)$ Let $f(x_1) = f(x_2)$ $f(x_2) = f(x_3)$ Let $f(x_1) = f(x_2)$ $f(x_2) = f(x_3)$ Let $f(x_1) = f(x_2)$ $f(x_2) = f(x_1)$		TOPIC DATE
My the semidefinite if $A>0$ $(A,z) \in C_1 = (A_1z) \in C_2  \forall (A_1z)$ $C_1 = C_2$ $C_1 \text{ yearseld}  C_2 \text{ is consisted}$ $C_1 \text{ is presented}  C_2 \text{ is consisted}$ $C_2 \text{ is stated}  C_3 \text{ is consisted}$ $C_4 \text{ is taked}  C_4 \text{ is presented}$ $C_5 \text{ is stated}  C_4 \text{ is stated}$ $C_5 \text{ is stated}  C_5 \text{ is consisted}$ $C_7 \text{ is stated}  C_7 \text{ is also optimal}$ $C_7  is also optimal$		: C, e correse
$(A, Z) \in C_1  2  (A, Z) \in C_2  \forall (A, Z)$ $C_1 = C_2$ $C_1 \text{ is source}  C_2 \text{ is source}$ $C_1 \text{ is source}  C_2 \text{ is source}$ $C_2 \text{ is source}  C_3 \text{ is source}$ $C_4 \text{ is source}  C_4 \text{ is source}$ $C_5 \text{ is source}  C_4 \text{ is source}$ $C_5 \text{ is source}  C_5 \text{ is source}$ $C_7 \text{ is source}  C_7  $		M is the semidefinite if A>O
500) Given: $f(\underline{x})$ is also optimal  where $f(\underline{x})$ is also optimal  where $f(\underline{x})$ is also optimal  if $f(\underline{x})$ is also optimal $f(\underline{x})$ is also op		(A, 2) & C, & (A, 2) & C2- + (A, 2)
Proof: let us take $x = (n_1)$ us the often  value of $x \in C$ we know that $f((n_1, n_2)) = f((n_2, n_1))$ if $(n_1, n_2) = f((n_2, n_1))$ but us take a faint on the line gaining $x \in C$ $f(x) = (x_1)$ $f(x) = (x_2) = (x_1)$ $f(x) = (x_1) = (x_2)$ $f(x) = (x_1) = (x_2)$ $f(x) = (x_1) = (x_2)$ $f(x) = (x_2)$ $f(x) = (x_1)$ $f(x) = (x_2)$		Ci is countre. Cr is countre
Proof: let us take $x = (n_1)$ us the often  value of $x \in C$ we know that $f((n_1, n_2)) = f((n_2, n_1))$ if $(n_1, n_2) = f((n_2, n_1))$ but us take a faint on the line gaining $x \in C$ $f(x) = (x_1)$ $f(x) = (x_2) = (x_1)$ $f(x) = (x_1) = (x_2)$ $f(x) = (x_1) = (x_2)$ $f(x) = (x_1) = (x_2)$ $f(x) = (x_2)$ $f(x) = (x_1)$ $f(x) = (x_2)$		
Proof: let us take $x = (n_1)$ us the often  value of $x \in C$ we know that $f((n_1, n_2)) = f((n_2, n_1))$ $f(n_1, n_2) = f(n_2, n_1)$ Let us take a faint on the line joining $x \in C$ $f(n_1, n_2) = f(n_2, n_1)$ Let us take a faint on the line joining $x \in C$ $f(n_1, n_2) = f(n_2, n_1)$ $f(n_2, n_1) = f(n_2, n_1)$ $f(n_2, n_1) = f(n_2, n_1)$ Let us take a faint on the line joining $f(n_1) = f(n_2) = f(n_2)$ $f(n_2, n_1) = f(n_2) = f(n_2) = f(n_2) = f(n_2)$ Let us take $f(n_1, n_2) = f(n_2) = f(n_2) = f(n_2)$ Let $f(n_1, n_2) = f(n_2) = f(n_2) = f(n_2) = f(n_2)$ Let $f(n_1, n_2) = f(n_2) = f(n_2) = f(n_2) = f(n_2)$ Let $f(n_1, n_2) = f(n_2) = f(n_2$	5(0)	Given: f(7) is summething
value of $x \in C$ we know that $f((x_1, n_2)) = f((n_2, n_1))$ Let us take a fairt on the line joining $x \in C$ $f(x_1) = x + (1-0)y$ $= x + (1-0)y$ $= x + (1-0)y$ $= x + (1-0)y + (1-0) + (1-0)$ $= x + (1-0)y + (1-0)y$ $= x + (1-0)y + (1-0)y + (1-0)y$ $= x + (1-0)y + (1-0)y + (1-0)y$ $= x + (1-0)y + (1-0)y + (1-0)y + (1-0)y$ $= x + (1-0)y + $		To show I x with light the
we know that $f((x_1, x_2)) = f((x_2, x_1))$ we know that $f((x_1, x_2)) = f((x_2, x_1))$ Let up take a foint on the line joining $x$ is $ f = \theta x + (1-\theta)y $ $ = \theta f(x) + (1-\theta) f(y) $ $ = \theta f(x) $ $ = f(x) $ For every some optimization energy low  minima is a global minima $ f(x) = f(x) $ Let up fut $\theta = 1/2$ $ f(x) = f(x) $		Proof: let us to
we know that $f((x_1, x_2)) = f((x_2, x_1))$ we know that $f((x_1, x_2)) = f((x_2, x_1))$ Let up take a foint on the line joining $x$ is $ f = \theta x + (1-\theta)y $ $ = \theta f(x) + (1-\theta) f(y) $ $ = \theta f(x) $ $ = f(x) $ For every some optimization energy low  minima is a global minima $ f(x) = f(x) $ Let up fut $\theta = 1/2$ $ f(x) = f(x) $		12 le the often
that $f((x_1, x_2)) = f((x_2, x_1))$ $f(x_1)$ is also oftenal  Let us take a foint on the line joining $x_1$ is $f(x_1) = 0x + (1-0)y$ $f(x_1) = 0$		value of x & C
Let us take a foint on the line joining $x \in \mathbb{R}$ $f(\theta x + (1-\theta)y) = \theta f(x) + (1-\theta) f(y)$ $= \theta f(x) + (1-\theta) f(x)$ $= f(x)$ $f(x) = f(x)$		the know that II (21, 20, 1) - II (a)
Let up take a froint on the line joining $x \in \mathbb{R}$ $f(\theta x + (1-\theta)y) \leq \theta f(x) + (1-\theta) f(y)$ $= \theta f(x) + (1-\theta) f(x)$ $= f(x)$ $= f(x)$ For every convey of timization energy low which is a global mining $f(x) = f(x)$ Let up fut $\theta = 1/2$ $f(x) = f(x)$		also oftenal
$f(\theta x + (1-\theta)y) \leq \theta f(x) + (1-\theta) f(y)$ $= \theta f(x) + (1-\theta) f(x)$ $= f(x)$	-	Let us take a point on the line joining on &
$= f(\frac{x}{2}) + (1-\theta) f(\frac{x}{2})$ $= f(\frac{x}{2})$		= 02 + (1-0) y
$= f(\frac{x}{2}) + (1-\theta) f(\frac{x}{2})$ $= f(\frac{x}{2})$		C( 0x 1/1 0) 11 0 0
$= f(\frac{x}{2}) + (1-\theta) f(\frac{x}{2})$ $= f(\frac{x}{2})$		J( 0= +(1-0) g) = 0 f(x) +(1-0) f(g)
for every convey oftenization every law minima is a global minima f(P) = f(x) Let us furt $\theta = 1/2$ $f(\frac{x}{2} + \frac{y}{2}) = f(x)$	192	= 0f(2) + (1-0) f(3)
Let us fut $\theta = 1/2$ $f\left(\frac{n}{2} + \frac{y}{2}\right) = f(n)$		= f(X)
Let us fut $\theta = 1/2$ $f\left(\frac{n}{2} + \frac{y}{2}\right) = f(n)$		runna is a stall languation energy los
$ \frac{\text{lit us fuit } 0 = 1/2}{f\left(\frac{\pi}{2} + \frac{y}{2}\right) = f(\pi)} $		·-f(P) = f(x)
$f\left(\frac{2}{2} + \frac{4}{2}\right) = f(2)$	,	
		,
The state of the s		

	TOPIC DATE
	- we proved I a point qual so ordinates
(4)	To dial:
	To firs: man ni nz nn
	tt ∑ni=1 ; ni> 0 +i=1,n
	Let us Apply AM-COM as nick & n; 2,0
	<u> </u>
	=> 1 > (Tni)"
	$\Rightarrow$ $(/, \gamma = T)$
1 2 2	$\frac{1}{n} = \pi_i$
	the monument achievable value
	$\frac{1}{\sqrt{2}}$

	TOPICDATE
=	
6 A)	To prove: $f(z) = n^T n$ is conven.
	t
_	Proof: if g(n) is conven
	then $f(x, t) = t g(n)$ is also were,
-	# t>0
	: we fromed before that 1/2112 is comen
	$f(x,t) = tg(\frac{\pi}{z})$
_	$= t n^{T}n                                    $
~	$= n^{T} n$
	t
	f(x) is also corner
13)	To peroro: f(x)= nt n is quasi conven
	the first section of the section of
	Proof: For graci comen all sublends are comen .: $C = 4 \times 1 + f(x) \le x = 4 \times 1 +   x  ^2 \le x + 2$
	: C= 1 2: f(n) < 1 = 1 m : 11m11 < 1 +23
	= < M: 0 ×    m     × + 12 3
	let ni, n2 e c : 1/0 x, + (1-0) x2 /1 \le 0 + (1-0)  1 x1
	€ 0 + (1-0) + Ca
	i-f(2) is grove connex < to
_	Herre provad
	To frame: $f(2) =  n - n $ if $  n   +  $
_	111   2
	Privat: flm):
	1/2//
	: f(x)= )   n  -1   n  >1
	) .
	O else
	•

	TOPICDATE
	let us take 91, 1/2 st 1/2/1/2/12/12/12/12/12/12/12/12/12/12/12
-	f(0x,+(1-0) 22) = 1/02,+(1-0) 22/1-1 -0
	0f(21) +(1-0) f(22) = 0112111-\$ +(1-0)   m211
	= Offxill + (1-0)    M2 1-1 - D
	011211 4(1-0) 11221(1-1
	:. 0 20 henre f(x1 =  1x11-1
	is corner
	f(x)=0 is also comer when 11x11 =1
	man of 2 corner on a also could
	f(x) = / //mil-1 & //mil21
	f(x) = 1 11m11-1 & 11m1121
	il also ismese
	a f(2) con be written as
	man 6 119-11,03
1 2	man j linili, o 1
Commission of the Commission o	
-	
-	
5.	
-	
and the same	