Day M T W T F S

Date: / /

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Department BS(CS)

submatted to : Mansoor kadar

Date 25/6/2020

Assagnment No 3

Semeter 2nd

Question No 1

A consider a

the following a

vector R^3.

The vector R^3 we

can let any

equation form in the

related question.

Then we consider

a the following

vector in the

R_3

$$V_3 = (3, 5, -2)$$

$$V_2 = (3, 2, -1)$$

$$V_1 = (1, -1, 0)$$

(3) (7)

Day: M T W T F S   Date: / /

$\cdot\ T(u+v) = T(u) + T(v)$

solution:

The production vector.

$$x = \frac{\cancel{x}}{x}\begin{bmatrix} x_1 \\ x_2 \end{bmatrix}$$

total number of

A, B unit 1000 = 500

product x, y.

The examples

$T(u+v) = T(u)(v)$

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(a) (b)

Day: Date: / /

The production vector

$x = \begin{bmatrix} x_1 \\ x_2 \end{bmatrix}$ whears

x_1 and x_2 are

total number units

for product

A and B

1000 and 500.

(a) find total cost.

(b) Explain,

transformation propeties

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Day: M T W T F S (4) (5) Date: / /

Question 2

Solution.

(2) suppose that a company product two products x and

For each unit product produced money must be spent labor and materials and over head.

cost per unit	product x	product y
materials	RS. 450	RS. 400
Labor	RS, 250	RS 350
over head	RS 150	RS, 150.

we have

$$\begin{pmatrix} 1 & a \\ b & 1 \end{pmatrix} \cdot \begin{pmatrix} 1 & c \\ d & 1 \end{pmatrix}$$

$$= \begin{pmatrix} 1 & a+c \end{pmatrix}$$

$$k \odot \begin{pmatrix} 1 & 0 \\ b & 1 \end{pmatrix} \cdot \begin{pmatrix} 1 & ka \\ ab & 1 \end{pmatrix}$$

$\in V$

Answer.

we conclate that V is not a vector space with the given operation.

Day M T W T F S Date: / /

Question No3.

Sol. Determine whether or not

The following sets form vector spaces over. The given field.

(a) The set V of all matrices of the form

$\begin{pmatrix} 1 & a \\ b & 1 \end{pmatrix}$ where $a, b \in R$

with standard addition and scalar multiplications.

Note V is not closed under the addition.

$\begin{pmatrix} 1 & c \\ d & 1 \end{pmatrix}$

(1)

$\begin{pmatrix} 1 & a \\ b & 1 \end{pmatrix} + \begin{pmatrix} 1 & c \\ d & 1 \end{pmatrix} = \begin{pmatrix} 2 & a+c \\ b+d & 2 \end{pmatrix}$

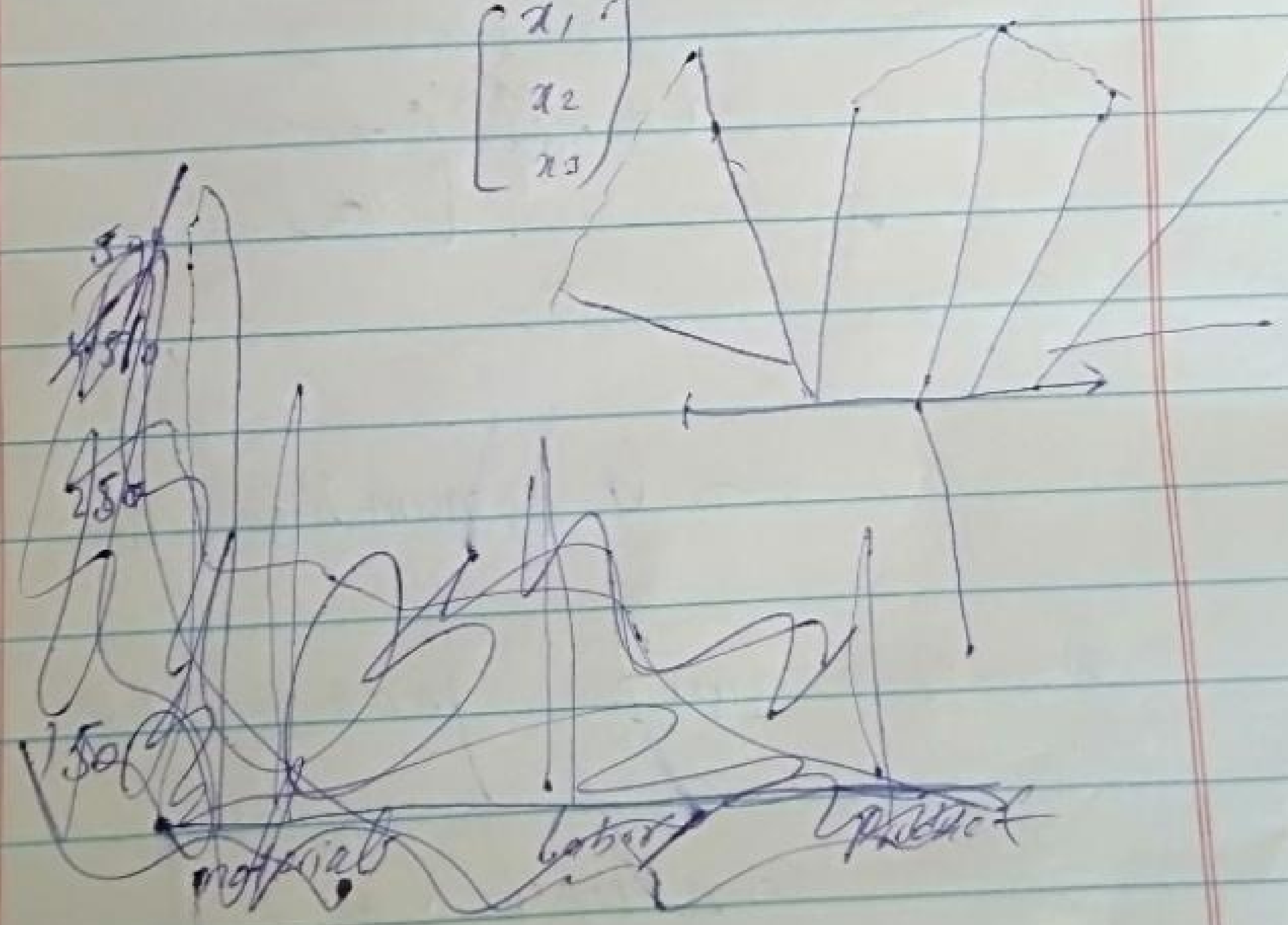
$\begin{pmatrix} 1 & a \\ b & 1 \end{pmatrix} \begin{pmatrix} 1 & c \\ d & 1 \end{pmatrix}$

$T(u+v) = T(u) + T(v)$

$T(cu) = cT(u)$

The labor cost per unit.

$$\begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix}$$



cost per unit 1500 − 1250

250

250 Ans

cost per unit A

Day: M T W T F S (13) Date: / /

Question 4

(B)

(i) Let $B = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$

$$\det B = \begin{vmatrix} 1 & 0 \\ 0 & 1 \end{vmatrix} = 1$$

(ii) Let $C = \begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix}$

$$\det(C) \begin{vmatrix} 0 & 1 \\ 1 & 0 \end{vmatrix} = 1$$

(iii) Let $D = \begin{bmatrix} 1 & 1+1 \\ 1 & 1 \end{bmatrix}$

$$\det(D) = \begin{vmatrix} 1 & 1+1 \\ 1 & 1 \end{vmatrix}$$

$$= \begin{vmatrix} 1 & 1+1 \\ 1 & 1 \end{vmatrix}$$

$= \begin{pmatrix} \frac{1}{kb} & \frac{ka}{1} \end{pmatrix}$

we c from that

v is indeed a

vector space with

the given operation

field that v is

closed under the

condition and

scalar

multiplication

operation forms.

End Q No 3.

Day: M T W T F S Date: / /

(a) A set V of ~~all~~ matrices of the ~~form~~ form $\begin{pmatrix} 1 & a \\ b & 1 \end{pmatrix}$

where $a, b \in R$

over R with Addition and ~~std~~ scalar multiplication. define by.

$$\begin{pmatrix} 1 & a \\ b & 1 \end{pmatrix} \begin{pmatrix} 1 & c \\ d & 1 \end{pmatrix}$$

$$= \begin{pmatrix} 1 & a+c \\ b+d & 1 \end{pmatrix}$$

$$k \begin{pmatrix} 1 & a \\ b & 1 \end{pmatrix}$$

16

Date: __/__/__

Day:

$\det(0) = 0$

Let $P \begin{bmatrix} 1+1 & 1+1 \\ 1+1 & 1+1 \end{bmatrix}$

$\det(P) = \begin{vmatrix} 1+1 & 1+1 \\ 1+1 & 1+1 \end{vmatrix}$

$= 0$

$\det(P) = 0$

15

Day: M T W T F S Date: / /

Question 4

(C)

Let $L = \begin{bmatrix} 1 & 0 \\ 1 & 0 \end{bmatrix}$

$\det(L) = 0$

let $M = \begin{bmatrix} 0 & 0 \\ 1 & 1 \end{bmatrix}$ = ~~det(M)~~

$\det(M) = \begin{vmatrix} 0 & 0 \\ 1 & 1 \end{vmatrix}$

let $N = \begin{bmatrix} 1+1 & 0 \\ 0 & 1 \end{bmatrix}$

$\det(N) \begin{vmatrix} 1+1 & 0 \\ 0 & 1 \end{vmatrix}$

$\det(N) = 0 \quad \because 1+1 = 0$

Let $O = \begin{bmatrix} 1+1 & 0 \\ 0 & 1+1 \end{bmatrix}$

$\det(O) \begin{vmatrix} 1+1 & 0 \\ 0 & 1 \end{vmatrix}$

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Date: __/__/__

Day:

$\therefore 1+1=0$

$= \begin{vmatrix} 1 & 0 \\ 1 & 1 \end{vmatrix}$

$= |1-0| = 1$

(iv) $E = \begin{bmatrix} 1 & 0 \\ 1+1 & 1 \end{bmatrix}$

$\det(E) = \begin{vmatrix} 1 & 0 \\ 1+1 & 1 \end{vmatrix}$

$= |1-0|$

$\because 1+1=0$

Ans

$\boxed{0 \text{ Ans}}$

(18)

Day M T W T F S Date: / /

$$= (1D_1 + D_3\, 1D_5 - 1D_1 + 2\cancel{D_1} + 1D_2$$

$$+ (\cancel{1D_1}\, \cancel{1D_2} + \cancel{1D_1} - \cancel{1D_1} + \cancel{1D_4}\, \cancel{2D_3}$$

$= 0$ Ans.

Question 4

(A)

$$A = \begin{pmatrix} 1D1 & 1D1 & 1D1 \\ 1D2 & 1D2 & 1D2 \\ 1D4 & 1D4 & 1D4 \end{pmatrix}$$

$$\det(A) = \begin{vmatrix} 1D1 & 1D1 & 2D1 \\ 1D2 & 1D3 & 1D2 \\ 1D4 & 2D1 & 1D5 \end{vmatrix}$$

$$1D1 \begin{vmatrix} 1D3 & 3D2 \\ 2D1 & 1D5 \end{vmatrix} - 1D1 \begin{vmatrix} 1D2 & 1D2 \\ 1D4 & 1D5 \end{vmatrix}$$

$$+ 1D1 \begin{vmatrix} 1D2 & 1D3 \\ 2D4 & 2D1 \end{vmatrix}$$

$$= 1D \cdot (2D_3 \cdot 1D5 - 1D_2\, 2D_1$$

$$- 1D_1 \cdot (2D \cdot 1D5 - 2D_4\, 1D_2)$$

$$+ 1D_1\, (1D_2 \cdot 1D_1 - 1D_4\, 1D_3$$

Day: M T W T F S Date: / /

(a) verify that the

general vector

$u(x, y, z)$

Then we narrated

the written as

a linear combination

of the v_1, v_2

and v_3

Then, The coefficients

will be expressed

as the

Day: M T W T F S (3) Date: / /

functions of the

entries

x, y

and z of u.

This shows that

span

$$\{v_1, v_2\ v_3\} = R_3$$

(b) can R_3

be spanned

by two

(4)

Date: / /

Day M T W T F S

vector

w_1 and w_2

be sure to

$\boxed{\text{Justify. Ans}}$

The consider the

vector R_3