

(gre) (btd) (wtz) = (abw + cdz+ adw+ bcz)=0. - It is closed under scalary multiplication: If (x, y, z) is in U, because then for any scalar c, (cox, cy, cz) is also in U, because (cx/cy/cz) = C3x4z=0. · U is vector subspace of R3 D) $V = \{(x,y,z) \in \mathbb{R}^3 \mid x + y + z = 0\}$ -The zero vector (0,0,0) is in this subject because 0+0 to 20. - It is closed under vector adolition: If (9, b, c) and (d,e,f) are in v, then their sum (atd, bte, ctf) is also in v because (a+d)+ (b+e)+(c+f)= (atbtc) + (dtetf) 50. It is closed under scalar multiplication. If (x, y, z) is in v, them toy any scalar e (cx, cy, cz) is also in V, because (and) PCBRETE (R+P) (ca) + (cy) + (cz) = e(x+y+z) = c(o) =0. V is vector subspace of RB.



Frest now is linearly independent

For 2nd event to be linearly independent of should be non-zero because it contains non-zero entries.

For 323 and show to be linearly independent.

B should be non-zero because it contains
nonzero entries.

So to have a samp of 2 x & B should both be non-zero. X to, B to-

Sz AMatrix A:

Materix A grotates clockwise by 30 degrees

$$A = \begin{pmatrix} \cos \theta & -\sin \theta \\ \sin \theta & \cos \theta \end{pmatrix}$$

For 30-degree clockwise explatinon 0 & 30°

$$A = (\cos (m_6) - \sin (m_6))$$

 $Sin(m_6) \cos (m_6)$

- Column space of A has dimension 2 since both columns are linearly independent

- Null Space of A is o.

- Row space of A has dimension 2 as its spanned by two sours.

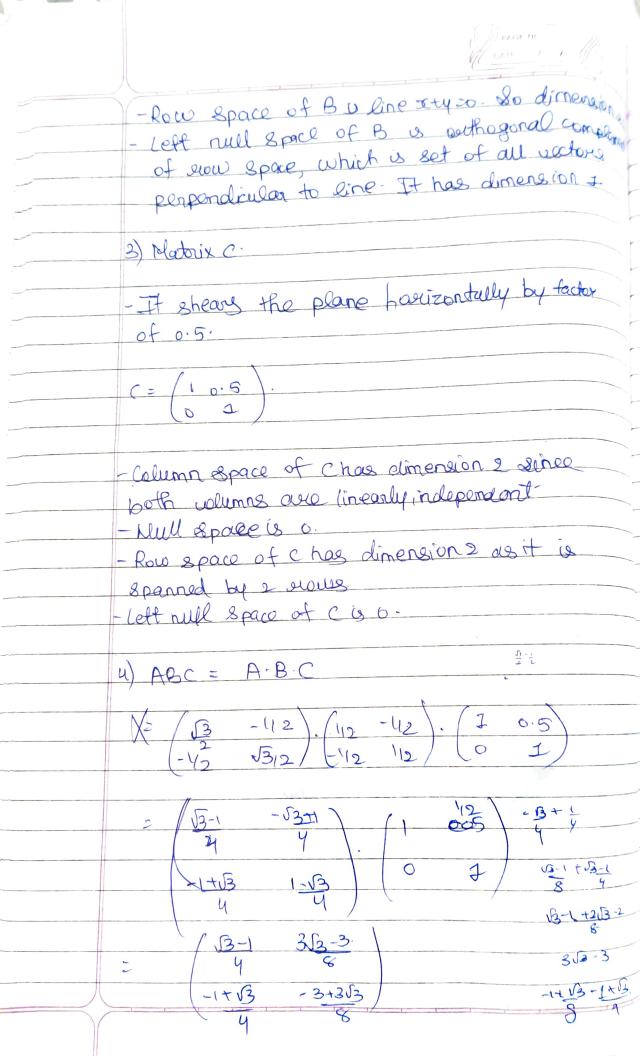
- left nul space of A is foly.

B) Matrix B

Materix B perojects elements of the plane onto the line aty=0. To use can wente B as the perjection matrix onto the line let u be the unit vector along the line 1/1/2, -1/1/3

$$B = VV^{T} = \begin{pmatrix} 1/2 & -1/2 \\ -1/2 & 1/2 \end{pmatrix}$$

-Column & pace of B is line x+4=0, so its dimension =



	Column space of X is 2 as both volumns are linearly independent. - Mull space is 0. - Row space has dimension 2 because it is spanned by 2 Hows. - Left null space is 0.
Sy.	$A = \begin{bmatrix} 5 & 14 & 38 & 47 & 10 \\ 1 & 3 & 8 & 10 & 2 \\ 1 & 2 & 6 & 7 & 3 \\ 4 & 8 & 24 & 28 & 12 \end{bmatrix}$
	Swap Ri and Ro 1 3 8 10 2 5 14 38 47 10 1 2 6 7 3 4 8 24 28 12
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My 200 . 11.

