Dear learners,

You are required to:

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Write equation no 3 and 4 as illustrated in class
Add a YouTube link to your markdown file
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Then remember to submit your work for review.

Thank you

3. (a) (i) Define what it means to say that a square matrix with real entries is ***diagonalisable*** over $\mathbb{R}$

(ii) Show that if A is a square matrix with real entries and **u** and **v** are eigen values of A corresponding to different eigenvalues, then **u** and **v** are linearly independent.

(b) (i) Consider 2×2 real square matrix

$$A = \begin{pmatrix} a & a \\ b & d \end{pmatrix}$$

Show tha A has atleast one real eigenvalue,, and that if $a \neq d$ or $b \neq 0$, then it has two sitinct real eigen values. Deduce that A is diagonalisable.

(ii) Determine the values of α and β for which the real matrix

$$A = \begin{pmatrix} 1 & \alpha \\ \beta & 1 \end{pmatrix}$$

is diagonalisable.

(iii) Determine the values of α and β for which the real matrix

$$A = \begin{pmatrix} a & b \\ c & a \end{pmatrix}$$

is diagonalisable.

4. Let **u** and **w** be vectors in $\mathbb{R}^3$

(a) (7 points) (i) Prove that **u**, **v** and **w** are linearly independent if and only if **u**. (**v** $\wedge$ **v**) $\neq 0$.

✓ 1s completed at 9:29 AM

(C)(6 points) Suppose that **u** **v** and **w** are linearly independent and that

r$= \alpha$**u** $+\beta$**v** $+c$**w**.

Find the coeffiecients α, β abd γ such that

r$= \alpha$**v**$\wedge$**w** $+\beta$**w**$\wedge$**u** $+\gamma$**u**$\wedge$**v**.

Youtube link