

$A = \begin{vmatrix} -1 & 2 & 4 \end{vmatrix}$ that all eigenvalues are

LINEAR ALGEBRA

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1. Consider the following matrix

$$A = \begin{bmatrix} 1 & -4 & -4 \\ 8 & -11 & -8 \\ -8 & 8 & 5 \end{bmatrix}$$

Find the similar matrix of A in the diagonal form. (50 pts).

2. Let $x = [x_1, x_2, \dots, x_n]$ and $y = [y_1, y_2, \dots, y_n]$, and α be a real constant. Show that $\|\alpha x + \alpha y\|_1 \leq |\alpha|(\|x\|_1 + \|y\|_1)$. (25 pts).

3. Let A be a symmetric matrix of 3×3 . Show that if A has all positive principal minors, then, A has all positive eigenvalues. (25 pts).

Duration : 75 Minutes