

LINEAR ALGEBRA I

BMA 2301

CAT I

1. Given that A is a 2×2 matrix i.e $A = \begin{pmatrix} a & b \\ c & d \end{pmatrix}$ show that

$$A^{-1} = \frac{1}{ad-bc} \begin{pmatrix} d & -b \\ -c & a \end{pmatrix} \quad (5 \text{ mks})$$

2. Show that $(A + B)^T = A^T + B^T$ (5 mks)

3. Reduce each of the following matrices to echelon form hence state their ranks

i. $\begin{pmatrix} 1 & 2 & 3 & 1 \\ 2 & 1 & 2 & 0 \\ -1 & -2 & -1 & 1 \\ 1 & -1 & 3 & 3 \end{pmatrix}$ (5 mks)

ii. $\begin{pmatrix} 0 & 1 & 3 & -2 \\ 2 & 1 & -4 & 3 \\ 2 & 3 & 2 & -1 \end{pmatrix}$ (5 mks)