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18/ENG02/084

MAT204

1. A linear transformation $T: U \longrightarrow T: U \longrightarrow V$, is a function that carries elements of the vector space U (called the domain) to the vector space V (called the co-domain).

2. $X = \begin{pmatrix} 1 & 2 & 8 \\ 4 & 7 & 6 \\ 9 & 5 & 3 \end{pmatrix}$

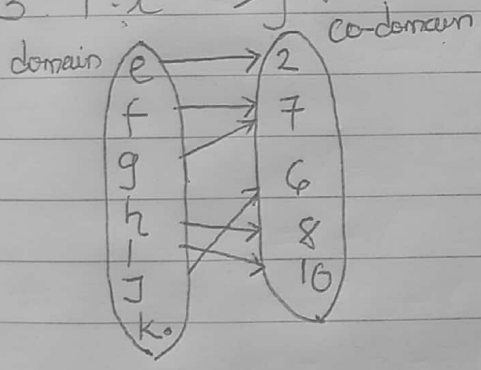
$$|X| = 1\begin{vmatrix} 7 & 6 \\ 5 & 3 \end{vmatrix} - 2\begin{vmatrix} 4 & 6 \\ 9 & 3 \end{vmatrix} + 8\begin{vmatrix} 4 & 7 \\ 9 & 5 \end{vmatrix}$$

$$|X| = 1(21-30) - 2(12-54) + 8(20-63)$$

$$|X| = -9 + 84 - 344 = -269$$

$|X| \neq 0 \therefore X$ is non-singular matrix

3. $T: X \longrightarrow Y$



4. Rank of Matrix: The rank of A is the maximal number of linearly independent column vectors in A, i.e. the maximal number of linearly independent vectors among $\{a_1, a_2, \ldots a_n\}$. IF $A=0$, then the rank of A is 0.