

1. Practice Problems - Rank of a matrix

Problem 1.1. Using row-reduced Echelon form find the rank of the following matrices.

$$1. A = \begin{pmatrix} 2 & -1 & 3 \\ 1 & 0 & 1 \\ 0 & 2 & -1 \\ 1 & 1 & 4 \end{pmatrix} \text{ Ans : } \rho(A) = 3$$

$$2. B = \begin{pmatrix} 1 & 3 & 1 & 1 \\ -1 & 1 & 2 & 2 \\ 2 & 1 & -2 & 1 \\ 1 & 2 & -2 & 2 \end{pmatrix} \text{ Ans : } \rho(B) = 4$$

$$3. C = \begin{pmatrix} 1 & 2 & -1 & 3 \\ 2 & 4 & 1 & -2 \\ 3 & 6 & 3 & -7 \end{pmatrix} \text{ Ans : } \rho(C) = 2$$

Problem 1.2. Show that the equations $x - 4y + 7z = 14$; $3x + 8y - 2z = 13$; $7x - 8y + 26z = 5$ are inconsistent.

Problem 1.3. Find k , if the equations $x + 2y - 3z = -2$; $3x - y - 2z = 1$; $2x + 3y - 5z = k$ are consistent. Ans: $k = -3$