

Rank of the matrix

Find the rank of the given matrix,

a) Is the matrix regular?

b) Are the vectors in the columns linearly independent?

1.

$$A = \begin{pmatrix} 1 & 2 & 1 \\ 2 & -1 & 7 \\ 3 & 1 & 8 \end{pmatrix}$$

2.

$$A = \begin{pmatrix} 2 & -1 & 1 & 1 \\ 3 & -1 & 1 & 0 \\ 1 & 1 & 2 & 1 \\ 4 & -3 & 0 & 0 \end{pmatrix}$$

3.

$$A = \begin{pmatrix} 0 & 3 & (1-k) \\ 3 & (1+k) & 0 \\ k & 2 & 0 \end{pmatrix},$$

for $k \in \mathbb{R}$ parameter.

Inverse matrix, matrix equations

1. Find the rank of matrix

$$A = \begin{pmatrix} 1 & 3 & 1 \\ 2 & 1 & 1 \\ 4 & 7 & 3 \end{pmatrix}$$

Find the inverse matrix (A^{-1}) to following matrices:

2. $A = \begin{pmatrix} 1 & 2 \\ 2 & 2 \end{pmatrix}$

3. $A = \begin{pmatrix} 2 & 2 & 3 \\ 1 & -1 & 0 \\ -1 & 2 & 1 \end{pmatrix}$

4. $A = \begin{pmatrix} 1 & 2 & 1 & 1 \\ 2 & 0 & 1 & 0 \\ 1 & 1 & 0 & 1 \\ 1 & 0 & 1 & 3 \end{pmatrix}$

5. $A = \begin{pmatrix} 1 & -5 & 8 \\ 1 & -2 & 1 \\ 2 & -1 & -5 \end{pmatrix}$