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18/sci01/003

Maths assignment

QUESTION 1

A singular matrix is a matrix whose determinant is equal to zero, while a non-singular matrix is a matrix whose determinant is not equal to zero.

QUESTION 2

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

$|X| = 3(20 - 42) – 9(4 - 12) + 2(7 - 10)$

$|X| = -66 + 72 – 6 = -0$

|X| EQUAL TO 0, Therefore, Matrix X is a Singular matrix

ii. $|Y| = \begin{pmatrix} 0 & 5 & 0 \\ -3 & -7 & -1 \\ 2 & 1 & 9 \end{pmatrix}$

$|Y| = 0(171 + 1) – 5(-27 + 2) + 0(-3 + 14)$

$|Y| = 0 + 125 – 0 = 125$

|Y|NOT EQUAL TO 0, Therefore, Matrix Y is a Non-Singular matrix

iii. $|C| = \begin{pmatrix} 1 & 7 & 8 \\ 1 & 0 & 5 \\ 11 & 6 & 12 \end{pmatrix}$

|C|= 1(0 - 30) – 7(12 - 55) + 8(6 - 0)

|C|= -30 + 301 + 48 = 319

|C|NOT EQUAL TO 0, Therefore, Matrix **C** is a Non-Singular matrix

iv. $|P| = \begin{pmatrix} 0 & 25 & 0 \\ -15 & -35 & -5 \\ 10 & 5 & 45 \end{pmatrix}$

|P|= 0(-1575 + 25) – 25(-675 + 50) + 0(-75 + 350)

|P|= -0 + 15625 – 0 = 15625

|P|NOT EQUAL TO 0, Therefore, Matrix 5Y is a Non-Singular matrix

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

|A|= 1(21 - 30) – 2(12 - 54) + 8(20 - 63)

|A|= -9 + 84 – 344 = - 269

|A| is not equal to zero Therefore, Matrix A is a Non-Singular matrix