

Step-1

$$A = \begin{pmatrix} 2 & c & c \\ c & c & c \\ 8 & 7 & c \end{pmatrix}$$

Given that

Case (i):- If $c = 2$

$$\begin{pmatrix} 2 & 2 & 2 \\ 2 & 2 & 2 \\ 8 & 7 & 2 \end{pmatrix}$$

Given matrix becomes

i.e. all the entries in row 1 and row 2 are same.

A is not invertible.

Step-2

Case (ii):- If $c = 7$

$$\begin{pmatrix} 2 & 7 & 7 \\ 7 & 7 & 7 \\ 8 & 7 & 7 \end{pmatrix}$$

Given matrix becomes

That is all the entries in column 2 and columns 3 are same.

A is not invertible.

Step-3

Case (iii):- If $c = 0$

$$\begin{pmatrix} 2 & 0 & 0 \\ 0 & 0 & 0 \\ 8 & 7 & 0 \end{pmatrix}$$

Given matrix becomes

That is all entries in row 2 (or column 3) are zeros.

A is not invertible.