

Exercise 7.3 (Determinant of a Matrix and Inverse Matrix)

Q1.

Find the determinant of given matrices.

(a) $A = \begin{pmatrix} 2 & 3 \\ 4 & 5 \end{pmatrix}$

(b) $B = \begin{pmatrix} 2 & 6 \\ 1 & 3 \end{pmatrix}$, what is the special name of matrix B

(c) $C = \begin{pmatrix} 1 & 3 \\ 2 & 4 \\ 4 & 2 \\ 5 & 7 \end{pmatrix}$

(d) $D = \begin{pmatrix} 0.1 & 0.2 \\ 0.3 & 0.4 \end{pmatrix}$

Q2.

If $A = \begin{pmatrix} -3 & h \\ -1 & 1 \end{pmatrix}$ is a singular matrix, find the value of h.

Q3.

If $C = \begin{pmatrix} z & t \\ 3 & 5 \end{pmatrix}$ and $|C| = 4$ then find the value of z in terms of t.

Q4.

(a) If $A = \begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix}$, find A^{-1}

(b) If $B = \begin{pmatrix} \frac{1}{2} & \frac{1}{3} \\ \frac{3}{4} & \frac{10}{7} \end{pmatrix}$, find B^{-1}

Q5.

If $B = \begin{pmatrix} 3 & 6 \\ 2 & 4 \end{pmatrix}$, explain why inverse of matrix B is not possible.

Q6.

If matrix B is inverse of matrix A, then find AB.

Q7.

Find 2×2 matrix for $2BB^{-1}$

Q8.

Given that $A = \begin{pmatrix} 1 & 2 \\ 0 & 3 \end{pmatrix}$ and $B = \begin{pmatrix} -4 & 3 \\ 1 & 2 \end{pmatrix}$.

If $A\mathbf{X} = B$, find matrix $\mathbf{X}$.

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Q9.

Find the matrix $\mathbf{X}$ such that $\mathbf{X} \begin{pmatrix} 3 & 2 \end{pmatrix} = \begin{pmatrix} 6 & 4 \\ -3 & -2 \end{pmatrix}$

Q10.

Find the inverse of $\begin{pmatrix} \frac{1}{2} & 1 \\ 0 & 1 \end{pmatrix}$

Answers: Exercise: 7.3

Q1a) -2 Q1b) 0, singular matrix Q1c) -16/35 Q1d) -0.02 Q2) h=3

Q3) $z = \frac{3t+4}{5}$ Q4) $-\frac{1}{2} \begin{pmatrix} 4 & 2 \\ -3 & 1 \end{pmatrix}$

Q5) Since $|B| = 0$, B is a singular matrix. Therefore inverse is not possible.

Q6) $I = \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$ Q7) $\begin{pmatrix} 2 & 0 \\ 0 & 2 \end{pmatrix}$ Q8) $X = \begin{pmatrix} -\frac{14}{3} & \frac{5}{3} \\ \frac{1}{3} & \frac{2}{3} \end{pmatrix}$ Q9) $\begin{pmatrix} 2 \\ -1 \end{pmatrix}$ Q10) $\begin{pmatrix} 2 & -2 \\ 0 & 1 \end{pmatrix}$