Matrices – Finding the Inverse of a 2 by 2 Matrix

Given the matrix $\mathbf{A} = \begin{bmatrix} a & b \\ c & d \end{bmatrix}$

The inverse of the matrix is given as $\mathbf{A}' = \frac{1}{\det \mathbf{A}} \begin{bmatrix} d & -b \\ -c & a \end{bmatrix}$

eg

$$\mathbf{A} = \begin{bmatrix} 3 & 4 \\ -7 & 9 \end{bmatrix}$$

$$\mathbf{A}' = \frac{1}{(3 \times 9) - (4 \times -7)} \begin{bmatrix} 9 & -4 \\ 7 & 3 \end{bmatrix}$$

$$= \frac{1}{55} \begin{bmatrix} 9 & -4 \\ 7 & 3 \end{bmatrix}$$

$$= \begin{bmatrix} \frac{9}{55} & \frac{-4}{55} \\ \frac{7}{55} & \frac{3}{55} \end{bmatrix}$$

Find the inverse of the following matrices.

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

B= $\begin{bmatrix} -1 & -2 \\ -3 & -4 \end{bmatrix}$

C= $\begin{bmatrix} 4 & -3 \\ -2 & -1 \end{bmatrix}$

D= $\begin{bmatrix} 7 & 5 \\ 5 & 7 \end{bmatrix}$

E= $\begin{bmatrix} -2 & 8 \\ 4 & 5 \end{bmatrix}$

F= $\begin{bmatrix} a & b \\ c & d \end{bmatrix}$

G= $\begin{bmatrix} 6 & -5 \\ 9 & -7 \end{bmatrix}$

H= $\begin{bmatrix} -4 & -6 \\ 8 & 2 \end{bmatrix}$

J= $\begin{bmatrix} 0 & 2 \\ 1 & 4 \end{bmatrix}$

K= $\begin{bmatrix} 5 & 2 \\ 6 & 4 \end{bmatrix}$

L= $\begin{bmatrix} -5 & -2 \\ -4 & 4 \end{bmatrix}$

M= $\begin{bmatrix} 7 & 5 \\ 2 & 1 \end{bmatrix}$

N= $\begin{bmatrix} 5 & 3 \\ 6 & 8 \end{bmatrix}$

O= $\begin{bmatrix} \frac{4}{5} & \frac{5}{6} \\ \frac{2}{3} & \frac{7}{10} \end{bmatrix}$

P= $\begin{bmatrix} \frac{4}{11} & \frac{1}{2} \\ \frac{2}{5} & \frac{9}{10} \end{bmatrix}$

Q= $\begin{bmatrix} 1\frac{9}{10} & \frac{4}{5} \\ 4 & 2\frac{3}{20} \end{bmatrix}$

R= $\begin{bmatrix} 9 & -2 \\ 3\frac{2}{7} & \frac{7}{9} \end{bmatrix}$