Name

Calculate the inverse of a 3 by 3 matrix using cofactors



1 Which is the cofactor matrix of this matrix of minors? Apply the sign pattern $(-1)^{i+j}$ to each entry of the matrix of minors.

$$\begin{bmatrix} -2 & -1 & -2 \\ 9 & 2 & 7 \\ -3 & 0 & 3 \end{bmatrix}$$

A

$$\begin{bmatrix} -2 & 1 & -3 \\ -9 & 2 & -10 \\ -3 & 0 & 3 \end{bmatrix}$$

B

$$\begin{bmatrix} -2 & 1 & -2 \\ -9 & 2 & -7 \\ -4 & 0 & 3 \end{bmatrix}$$

C

$$\begin{bmatrix} -2 & 1 & -2 \\ -9 & 2 & -7 \\ -3 & 0 & 3 \end{bmatrix}$$

D

$$\begin{bmatrix} -2 & -1 & -2 \\ -9 & 2 & -7 \\ -3 & 0 & 3 \end{bmatrix}$$

2 What is the determinant of this matrix?

$$\begin{bmatrix} 3 & 8 & 3 \\ 5 & -9 & 6 \\ 2 & 2 & 5 \end{bmatrix}$$

A	B	C
-194	-197	-191
D	**E**	**F**
-186	-192	-190

3 The determinant is -126 and the adjoint is shown. What is the entry at row 2, column 2 of the inverse? Use $A^{-1} = \frac{1}{\vert A \vert} \text{adj}(A)$.

A	B	C
-0.5	-1.5	0
D	**E**	**F**
0.5	-0.25	-1

4 Which shows row 3 of the adjoint of this matrix of minors? Fill only that row and leave the other entries blank. Apply the sign pattern $(-1)^{i+j}$ to the matrix of minors to get the cofactor matrix, then transpose it: $\text{adj}(A) = C^{T}$.

A

$$\begin{bmatrix} \square & \square & \square \\ \square & \square & \square \\ 2 & -7 & 5 \end{bmatrix}$$

B

$$\begin{bmatrix} \square & \square & \square \\ \square & \square & \square \\ 2 & -6 & 8 \end{bmatrix}$$

C

$$\begin{bmatrix} \square & \square & \square \\ \square & \square & \square \\ 1 & -4 & 8 \end{bmatrix}$$

D

$$\begin{bmatrix} \square & \square & \square \\ \square & \square & \square \\ 4 & -4 & 8 \end{bmatrix}$$

5 For the cofactor expansion along the first row, what is the value of the third term?

A	B	C
-36	-37	-35
D	**E**	**F**
-42	-32	-31

Name

Calculate the inverse of a 3 by 3 matrix using cofactors

6 Which grid shows the cofactor signs for a matrix of this size?

$$\begin{bmatrix} 2 & 6 & 1 \\ 2 & -3 & 3 \\ -3 & -9 & 4 \end{bmatrix}$$

A

$$\begin{bmatrix} + & - & + \\ - & + & - \\ + & - & + \end{bmatrix}$$

B

$$\begin{bmatrix} - & + & - \\ + & - & + \\ - & + & - \end{bmatrix}$$

7 The determinant is 840 and the adjoint is shown. Which is the inverse matrix? Use $A^{-1} = \frac{1}{\vert A \vert} \text{adj}(A)$.

$$\begin{bmatrix} 78 & 60 & -4 \\ -36 & -60 & 88 \\ 48 & -60 & -24 \end{bmatrix}$$

A

$$\begin{bmatrix} 0.09 & 0.07 & 0 \\ -0.04 & -0.07 & 0.1 \\ 0.06 & -0.07 & 0.97 \end{bmatrix}$$

B

$$\begin{bmatrix} 0.09 & -0.93 & 0 \\ -0.04 & -2.07 & 0.1 \\ 0.06 & -0.07 & -0.03 \end{bmatrix}$$

C

$$\begin{bmatrix} 0.09 & 0.07 & 0 \\ -0.04 & -0.07 & 0.1 \\ 0.06 & -3.07 & -0.03 \end{bmatrix}$$

D

$$\begin{bmatrix} 0.09 & 0.07 & 0 \\ -0.04 & -0.07 & 0.1 \\ 0.06 & -0.07 & -0.03 \end{bmatrix}$$

8 Which is the adjoint of this matrix of minors? Apply the sign pattern $(-1)^{i+j}$ to the matrix of minors to get the cofactor matrix, then transpose it: $\text{adj}(A) = C^{T}$.

$$\begin{bmatrix} 8 & 0 & -7 \\ 0 & -5 & -8 \\ 6 & 2 & -9 \end{bmatrix}$$

A

$$\begin{bmatrix} 8 & 0 & 6 \\ 4 & -5 & -2 \\ -7 & 8 & -9 \end{bmatrix}$$

B

$$\begin{bmatrix} 8 & 0 & 6 \\ 0 & -6 & -2 \\ -7 & 8 & -8 \end{bmatrix}$$

C

$$\begin{bmatrix} 8 & 0 & 6 \\ 0 & -5 & 0 \\ -7 & 8 & -9 \end{bmatrix}$$

D

$$\begin{bmatrix} 8 & 0 & 6 \\ 0 & -5 & -2 \\ -7 & 8 & -9 \end{bmatrix}$$

Name

Calculate the inverse of a 3 by 3 matrix using cofactors

9 The determinant is 526 and the adjoint is shown. Which shows row 3 of the inverse? Fill only that row and leave the other entries blank.

A

$$\begin{bmatrix} \square & \square & \square \\ \square & \square & \square \\ 0.4 & -0.83 & 0.4 \end{bmatrix}$$

B

$$\begin{bmatrix} \square & \square & \square \\ \square & \square & \square \\ -0.1 & -0.83 & -0.1 \end{bmatrix}$$

C

$$\begin{bmatrix} \square & \square & \square \\ \square & \square & \square \\ -0.1 & -0.08 & -0.1 \end{bmatrix}$$

D

$$\begin{bmatrix} \square & \square & \square \\ \square & \square & \square \\ -1.6 & -0.33 & 0.15 \end{bmatrix}$$

10 Which shows column 3 of the adjoint of this cofactor matrix? Fill only that column and leave the other entries blank. The adjoint is the transpose of the cofactor matrix: $\text{adj}(A) = C^{T}$.

A

$$\begin{bmatrix} \square & \square & 5 \\ \square & \square & -3 \\ \square & \square & 8 \end{bmatrix}$$

B

$$\begin{bmatrix} \square & \square & 3 \\ \square & \square & -5 \\ \square & \square & 11 \end{bmatrix}$$

C

$$\begin{bmatrix} \square & \square & 2 \\ \square & \square & -6 \\ \square & \square & 8 \end{bmatrix}$$

D

$$\begin{bmatrix} \square & \square & 2 \\ \square & \square & -2 \\ \square & \square & 9 \end{bmatrix}$$