

Matrix inverses

1. a) Find the inverse of $A = \begin{pmatrix} 1 & 2 & 1 \\ 1 & 4 & 0 \\ 2 & 1 & 5 \end{pmatrix}$.

b) Use part (a) to solve the system of equations

$$\begin{aligned}x + 2y + z &= 1 \\x + 4y &= 0 \\2x + y + 5z &= 3\end{aligned}$$

2. a) Find $\begin{pmatrix} a & b \\ c & d \end{pmatrix}^{-1}$ using the method of cofactors.

b) Memorize these steps for finding the inverse of a 2×2 matrix:

(i) Switch a and d . (ii) Change the signs on b and c . (iii) Divide by the determinant.

c) Find $\begin{pmatrix} 6 & 5 \\ 1 & 2 \end{pmatrix}^{-1}$.

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18.02SC Multivariable Calculus
Fall 2010

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