

1. Solve the matrix equation  $AX = B$  for  $X$ .

$$A = \begin{bmatrix} 1 & 4 \\ -4 & 3 \end{bmatrix}, B = \begin{bmatrix} -8 \\ -25 \end{bmatrix}$$

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$$X = \begin{bmatrix} \square \\ \square \end{bmatrix}$$

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2. A system of equations is given, together with the inverse of the coefficient matrix. Use the inverse of the coefficient matrix to solve the system of equations.

$$\begin{aligned} 4x + y &= -3 \\ 2x - y + 3z &= -4 \\ x + y + z &= -5 \end{aligned} \quad A^{-1} = \frac{1}{15} \begin{bmatrix} 4 & 1 & -3 \\ -1 & -4 & 12 \\ -3 & 3 & 6 \end{bmatrix}$$

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Complete the solution.

$$(\square, \square, \square)$$

(Type an exact answer.)

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3. A system of equations is given, together with the inverse of the coefficient matrix. Use the inverse of the coefficient matrix to solve the system of equations.

$$\begin{aligned} 3x + y &= 2 \\ 3x - y + 4z &= 4 \\ x + y + z &= 2 \end{aligned} \quad A^{-1} = \frac{1}{14} \begin{bmatrix} 5 & 1 & -4 \\ -1 & -3 & 12 \\ -4 & 2 & 6 \end{bmatrix}$$

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Complete the solution.

$$(\square, \square, \square)$$

(Type an exact answer.)

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4. Solve the following system of equations by using the inverse of the coefficient matrix A. ( $AX = B$ )

$$\begin{aligned}4x - y + 4z &= -16 \\5y + 8z &= 20 \\-4x + 4y + 5z &= 28\end{aligned}$$

Find the inverse of the coefficient matrix A. Select the correct choice below and, if necessary, fill in the answer boxes to complete your choice.

A. The inverse,  $A^{-1}$  is  $\begin{bmatrix} \blacksquare & \blacksquare & \blacksquare \\ \blacksquare & \blacksquare & \blacksquare \\ \blacksquare & \blacksquare & \blacksquare \end{bmatrix}$ .

B. Finding the inverse is not possible.

The solution of the system is  $\square$ . (Type an ordered triple.)

5. An economy depends on two basic products, wheat and oil. To produce 1 metric ton of wheat requires 0.26 metric tons of wheat and 0.33 metric tons of oil. Production of 1 metric ton of oil consumes 0.07 metric tons of wheat and 0.14 metric tons of oil. Find the production that will satisfy a demand for 410 metric tons of wheat and 990 metric tons of oil.

Input-output matrix  $A = \begin{bmatrix} 0.26 & 0.07 \\ 0.33 & 0.14 \end{bmatrix}$

How much wheat is required to satisfy the demand?

metric tons

(Round the final answer to the nearest whole number as needed. Round the elements of the inverse matrix to two decimal places as needed.)

How much oil is required to satisfy the demand?

metric tons

(Round the final answer to the nearest whole number as needed. Round the elements of the inverse matrix to two decimal places as needed.)