

Practice B

For use with pages 223–229

Tell whether the matrix has an inverse.

1. $\begin{bmatrix} 8 & 2 & 0 \\ 4 & 1 & -1 \\ 0 & 0 & 4 \end{bmatrix}$

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

3. $\begin{bmatrix} 5 & 1 & 0 \\ 2 & 3 & -2 \\ 1 & 3 & 1 \end{bmatrix}$

Find the inverse of the matrix, if it exists.

4. $\begin{bmatrix} 3 & 5 \\ -1 & 2 \end{bmatrix}$

5. $\begin{bmatrix} 1 & 0 \\ 2 & 4 \end{bmatrix}$

6. $\begin{bmatrix} -2 & 5 \\ 3 & 1 \end{bmatrix}$

7. $\begin{bmatrix} -6 & 3 \\ 5 & -3 \end{bmatrix}$

8. $\begin{bmatrix} 3 & -4 \\ 6 & -8 \end{bmatrix}$

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

Use a graphing calculator to find the inverse of the matrix.

10. $\begin{bmatrix} 2 & 4 & -1 \\ 0 & 4 & 1 \\ 0 & 0 & 2 \end{bmatrix}$

11. $\begin{bmatrix} 1 & 3 & 5 \\ 0 & 1 & 1 \\ 2 & 1 & 0 \end{bmatrix}$

12. $\begin{bmatrix} 0 & 2 & 6 \\ -2 & 4 & 1 \\ 0 & 1 & 2 \end{bmatrix}$

Solve the matrix equation.

13. $\begin{bmatrix} -4 & 2 \\ 8 & 1 \end{bmatrix}X = \begin{bmatrix} -16 & 6 \\ 22 & 13 \end{bmatrix}$

14. $\begin{bmatrix} 4 & 7 \\ 1 & 2 \end{bmatrix}X = \begin{bmatrix} 9 & 12 & 0 \\ -4 & 5 & -2 \end{bmatrix}$

15. $\begin{bmatrix} 4 & 7 \\ 1 & 2 \end{bmatrix}X + \begin{bmatrix} 2 & 7 \\ -3 & 4 \end{bmatrix} = \begin{bmatrix} 6 & 2 \\ -2 & 3 \end{bmatrix}$

16. $\begin{bmatrix} 6 & 2 \\ 4 & -2 \end{bmatrix}X - \begin{bmatrix} 2 & -2 \\ 3 & 1 \end{bmatrix} = \begin{bmatrix} 8 & 2 \\ 6 & -4 \end{bmatrix}$

Encoding Messages In Exercises 17–21, use the following information.The message, MEET ME AT SUNSET, is to be encoded using the matrix $A = \begin{bmatrix} 5 & -3 \\ 2 & -1 \end{bmatrix}$.

17. Convert the message into 1×2 uncoded row matrices.
18. Multiply each of the uncoded row matrices found in Exercise 20 by A to obtain the coded row matrices.
19. Write the message in code.
20. Find the inverse of A .
21. You receive the following response: 100, -57 , 100, -60 , 130, -75 , 88, -51 , 51, -29 , 100, -60 . Use the inverse of A to decode the response.