

Name _____ Class _____ Date _____

Practice 4-5**2 × 2 Matrices, Determinants, and Inverses**Find the matrix E^{-1} for each.

1. $E = \begin{bmatrix} 2 & -2 \\ -1 & 2 \end{bmatrix}$

2. $E = \begin{bmatrix} 1 & -1 \\ 1 & 1 \end{bmatrix}$

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

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

5. $E = \begin{bmatrix} 1 & 4 \\ 1 & 3 \end{bmatrix}$

6. $E = \begin{bmatrix} 4 & 7 \\ 3 & 5 \end{bmatrix}$

Find the inverse of each matrix, if it exists. If it does not exist, write *no inverse* and explain why not.

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

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

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

10. $\begin{bmatrix} 30 & -4 \\ -25 & 3 \end{bmatrix}$

Solve each matrix equation.

11. $\begin{bmatrix} 1 & 2 \\ -1 & -2 \end{bmatrix} X = \begin{bmatrix} 2 \\ -2 \end{bmatrix}$

12. $\begin{bmatrix} 1 & 1 \\ 1 & -1 \end{bmatrix} X = \begin{bmatrix} 3 \\ -1 \end{bmatrix}$

13. $\begin{bmatrix} -2 & 3 \\ -4 & 5 \end{bmatrix} X = \begin{bmatrix} 6 \\ 8 \end{bmatrix}$

Evaluate the determinant of each matrix.

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

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

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

17. $\begin{bmatrix} 4 & -3 \\ 1 & -8 \end{bmatrix}$

18. $\begin{bmatrix} 5 & 4 \\ 4 & 5 \end{bmatrix}$

19. $\begin{bmatrix} 1 & -12 \\ 3 & 0 \end{bmatrix}$

Determine whether the matrices are multiplicative inverses.

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

21. $\begin{bmatrix} 4 & 9 \\ 2 & 6 \end{bmatrix}, \begin{bmatrix} 1 & -\frac{3}{2} \\ -\frac{1}{3} & \frac{2}{3} \end{bmatrix}$

22. $\begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}, \begin{bmatrix} -2 & 1 \\ \frac{3}{2} & -\frac{1}{2} \end{bmatrix}$

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Practice 4-6**3 × 3 Matrices, Determinants, and Inverses**

Where necessary, use a graphing calculator. Find the inverse (A^{-1}) of each matrix, if it exists. If it does not exist, write *no inverse*.

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

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

3.
$$\begin{bmatrix} 2 & 4 & 3 \\ 0 & 5 & -1 \\ 1 & -1 & 2 \end{bmatrix}$$

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

5.
$$\begin{bmatrix} 4 & 5 & 6 \\ 0 & 1 & 2 \\ 8 & 9 & 5 \end{bmatrix}$$

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

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

8.
$$\begin{bmatrix} -3 & -2 & -1 \\ 0 & 1 & 2 \\ 3 & 4 & -4 \end{bmatrix}$$

Solve each equation for X .

9.
$$\begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix} X = \begin{bmatrix} 4 \\ -5 \\ 3 \end{bmatrix}$$

10.
$$\begin{bmatrix} 1 & 2 & 0 \\ -2 & 0 & -3 \\ 3 & -1 & 5 \end{bmatrix} X = \begin{bmatrix} -1 \\ 12 \\ -20 \end{bmatrix}$$

11.
$$\begin{bmatrix} 0 & 0 & 1 \\ 0 & 0 & 1 \\ 1 & 1 & 1 \end{bmatrix} X = \begin{bmatrix} 3 \\ 4 \\ 3 \end{bmatrix}$$

Evaluate the determinant of each matrix.

12.
$$\begin{bmatrix} -1 & 2 & -2 \\ 0 & 1 & 3 \\ 4 & 2 & -1 \end{bmatrix}$$

13.
$$\begin{bmatrix} 2 & 1 & 2 \\ -1 & 0 & 5 \\ 0 & 4 & 1 \end{bmatrix}$$

14.
$$\begin{bmatrix} 2 & 4 & 3 \\ -3 & 0 & -2 \\ -1 & 3 & 0 \end{bmatrix}$$

15.
$$\begin{bmatrix} 2 & 6 & -1 \\ 1 & 0 & 0 \\ 1 & 3 & -2 \end{bmatrix}$$

16.
$$\begin{bmatrix} -4 & 0 & 3 \\ 0 & -2 & 3 \\ -1 & 4 & -2 \end{bmatrix}$$

17.
$$\begin{bmatrix} 7 & -1 & 3 \\ 1 & 2 & 6 \\ 4 & 1 & 3 \end{bmatrix}$$

Determine whether the matrices are multiplicative inverses.

18.
$$A = \begin{bmatrix} -2 & 2 & 3 \\ 1 & -1 & 0 \\ 0 & 1 & 4 \end{bmatrix}, B = \begin{bmatrix} -\frac{4}{3} & -\frac{5}{3} & 1 \\ -\frac{4}{3} & -\frac{8}{3} & 1 \\ 1 & \frac{2}{3} & 0 \end{bmatrix}$$

19.
$$A = \begin{bmatrix} 2 & -17 & 11 \\ -1 & 11 & -7 \\ 0 & 3 & -2 \end{bmatrix}, B = \begin{bmatrix} 1 & 1 & 2 \\ 2 & 4 & -3 \\ 3 & 6 & -5 \end{bmatrix}$$

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