Name _____ Class _____ Date _____

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