

Name:  
Instructor:

Date:  
Section:

### Practice Set 4.4

Use the choices to fill in each blank.

multiplied      augmented      square      inconsistent      consistent  
added      row echelon      round      dependent      switched

1. A matrix with an equal number of rows and columns is called a(n) \_\_\_\_\_ matrix.
2. A matrix of the form  $\left[ \begin{array}{ccc|c} 1 & a & b & p \\ 0 & 1 & c & q \\ 0 & 0 & 1 & r \end{array} \right]$  is in \_\_\_\_\_ form.
3. A matrix containing the coefficients of the variables of a system of equations on the left side of the vertical line and the constants on the right side of the vertical line is called a(n) \_\_\_\_\_ matrix.
4. To perform row transformations, all numbers in a row may be \_\_\_\_\_ by any nonzero number.
5. To perform row transformations, the order of rows may be \_\_\_\_\_.
6. To perform row transformations, products of any row can be \_\_\_\_\_ to the corresponding numbers in any other row.
7. When solving a system of equations using matrices, if a row contains all zeros, the system is \_\_\_\_\_.
8. When solving a system of equations using matrices, if a row contains all zeros on the left and a nonzero number on the right, the system is \_\_\_\_\_.

Perform each row transformation indicated and write the new matrix.

9.  $\left[ \begin{array}{cc|c} 3 & -9 & -27 \\ 7 & 7 & 4 \end{array} \right]$  Multiply numbers in the first row by  $\frac{1}{3}$ .      9. \_\_\_\_\_

10.  $\left[ \begin{array}{ccc|c} 4 & 6 & 2 & 1 \\ 5 & 4 & 3 & 2 \\ 1 & 1 & 2 & -6 \end{array} \right]$  Switch row 1 and row 3.      10. \_\_\_\_\_

11.  $\left[ \begin{array}{cc|c} 1 & 3 & 4 \\ \frac{1}{2} & 6 & 2 \end{array} \right]$  Multiply the numbers in the first row by  $-\frac{1}{2}$  and add the products to the second row.      11. \_\_\_\_\_

12.  $\left[ \begin{array}{ccc|c} 1 & 3 & -1 & -5 \\ 2 & -1 & 2 & 13 \\ -1 & 2 & 1 & 0 \end{array} \right]$  Multiply numbers in the third row by 2 and add the products to the second row.      12. \_\_\_\_\_

Solve each system using matrices.

$$\begin{aligned} 13. \quad x - 2y &= -7 \\ -x + y &= 1 \end{aligned}$$

$$\begin{aligned} 14. \quad x + 3y &= -1 \\ -3x + 4y &= 16 \end{aligned}$$

13. \_\_\_\_\_

14. \_\_\_\_\_

$$\begin{aligned} 15. \quad 7x - 14y &= 0 \\ 6x + 4y &= 16 \end{aligned}$$

$$\begin{aligned} 16. \quad 4x + 3y &= 5 \\ -2x + y &= 0 \end{aligned}$$

15. \_\_\_\_\_

16. \_\_\_\_\_

$$\begin{aligned} 17. \quad x - 2y + 3z &= 6 \\ -2x - y + z &= -1 \\ 3x + 2y - z &= 4 \end{aligned}$$

$$\begin{aligned} 18. \quad a + 2b &= 1 \\ b - c &= -1 \\ 2a + 5c &= 8 \end{aligned}$$

17. \_\_\_\_\_

18. \_\_\_\_\_

$$\begin{aligned} 19. \quad x + 2y + 3z &= 16 \\ -3x - y + 2z &= 11 \\ 2x - 3y - z &= -17 \end{aligned}$$

$$\begin{aligned} 20. \quad 3x - 2y + z &= 2 \\ x + y - z &= 0 \\ 6x - 4y + 2z &= 4 \end{aligned}$$

19. \_\_\_\_\_

20. \_\_\_\_\_

$$\begin{aligned} 21. \quad 4x - 8y + 6z &= -1 \\ -4x + 2y - z &= 0 \\ 2x - 4y + 3z &= -3 \end{aligned}$$

$$\begin{aligned} 22. \quad 3x - 4y + 5z &= 7 \\ x - y + z &= -3 \\ -9x + 12y - 15z &= -21 \end{aligned}$$

21. \_\_\_\_\_

22. \_\_\_\_\_