

NAME \_\_\_\_\_

SCORE \_\_\_\_\_

**Matrices; Addition and Scalar Multiplication**

Write the zero matrix of the dimensions specified.

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

2.  $0_{2 \times 2} \begin{bmatrix} 0 & 0 \\ 0 & 0 \end{bmatrix}$

3.  $0_{2 \times 4}$

4.  $0_{4 \times 1}$

5.  $0_{1 \times 5}$

6.  $0_{3 \times 3}$

Find the value of each variable.

7.  $0_{2 \times 1} = \begin{bmatrix} 2x \\ 5 + y \end{bmatrix}$  -----

8.  $0_{2 \times 2} = \begin{bmatrix} x^2 & z - 1 \\ 5y & 3 - a \end{bmatrix}$  -----

9.  $\begin{bmatrix} x + 5 \\ 5y \\ 2z \end{bmatrix} = \begin{bmatrix} 3 \\ 10 \\ z + 3 \end{bmatrix}$  -----

10.  $\begin{bmatrix} 3x & 6 \\ z & 2y \end{bmatrix} = \begin{bmatrix} 5 - y & 3a \\ 5a & x - 4 \end{bmatrix}$  -----

Perform the indicated operations. Express each result as a single matrix.

11.  $\begin{bmatrix} 2 \\ -7 \\ 3 \end{bmatrix} + \begin{bmatrix} -5 \\ 4 \\ -6 \end{bmatrix}$  -----

12.  $\begin{bmatrix} 0 & 5 \\ 3 & -6 \\ -1 & 3 \end{bmatrix} - \begin{bmatrix} 2 & 4 \\ 1 & 7 \\ -1 & 0 \end{bmatrix}$  -----

13.  $2[5 \ -1 \ 3] + 0_{1 \times 3} - [1 \ 1 \ 1]$  -----

14.  $3 \begin{bmatrix} 2 & -1 & 2 \\ 5 & 3 & -1 \end{bmatrix} - 2 \begin{bmatrix} 3 & 2 & 2 \\ 4 & 5 & -3 \end{bmatrix}$  -----

Solve each equation for the matrix  $X$ .

15.  $\begin{bmatrix} 3 & -1 \\ -2 & 5 \end{bmatrix} + X_{2 \times 2} = 0_{2 \times 2}$  -----

16.  $[4 \ -2 \ -3] - X_{1 \times 3} = 0_{1 \times 3}$  -----

17.  $\begin{bmatrix} 4 & 3 & 2 \\ 1 & -1 & 3 \end{bmatrix} + X_{2 \times 3} = \begin{bmatrix} 2 & 4 & 0 \\ 2 & 2 & 0 \end{bmatrix}$  -----

18.  $3 \begin{bmatrix} 1 & -5 \\ 4 & 2 \end{bmatrix} + X_{2 \times 2} = \begin{bmatrix} 0 & 5 \\ 6 & 0 \end{bmatrix}$  -----