Matrix Basics

Name: _____

Determine the dimensions of each matrix.

1) $\begin{bmatrix} 3 & 5 & -7 \\ 1 & 2 & 9 \\ -2 & 6 & 1 \\ 4 & -3 & 5 \end{bmatrix}$

2) $\begin{bmatrix} 4 & 9 \\ -5 & 1 \\ 2 & -6 \end{bmatrix}$

3) $\begin{bmatrix} 4 \\ 3 \end{bmatrix}$

4) $\begin{bmatrix} 1 & 4 & 5 & -2 \\ -6 & 2 & 0 & 3 \\ 3 & 8 & -1 & 4 \end{bmatrix}$

Tell whether each statement is sometimes, always, or never true.

5) If matrices *A* and *B* have an equal number of entries, then *A* + *B* is defined.

6) If matrices *A* and *B* have a different number of entries, then *A* + *B* is defined.

7) If matrices *A* and *B* each have four rows and three columns, then *A* + *B* is defined.

8) If *A* + *B* is defined, then *A* – *B* is defined.

Perform the indicated matrix operations. If it cannot be done, write "undefined."

9) $\begin{bmatrix} 3 & 6 \\ -1 & -3 \\ -5 & -1 \end{bmatrix} + \begin{bmatrix} 0 & -1 \\ 6 & 0 \\ 2 & 3 \end{bmatrix}$

10) $5\begin{bmatrix} 5 & 1 \\ 1 & -2 \\ 1 & 2 \end{bmatrix}$

11) $\begin{bmatrix} -4n & n+m \\ -2n & -4n \end{bmatrix} + \begin{bmatrix} 4 & -5 \\ 3m & 0 \end{bmatrix}$

12) $7\begin{bmatrix} 2 & -1 & 8 \\ 4 & 7 & 9 \end{bmatrix} - 2\begin{bmatrix} -1 & 4 & -3 \\ 7 & 2 & -6 \end{bmatrix}$

13) $\begin{bmatrix} 5 & 3 \\ 5 & 1 \end{bmatrix} - \begin{bmatrix} -6 & 0 \\ 1 & -4 \end{bmatrix} - \begin{bmatrix} 5 & 4 \\ -2 & -6 \end{bmatrix}$

14) $\frac{3}{4}\begin{bmatrix} 8 & 12 \\ -16 & 20 \end{bmatrix} + \frac{2}{3}\begin{bmatrix} 27 & -9 \\ 54 & -18 \end{bmatrix}$

15) $6\begin{bmatrix} 1 \\ -3 \\ 0 \end{bmatrix} + 5\begin{bmatrix} 2 \\ 7 \\ -8 \end{bmatrix} - 3\begin{bmatrix} -1 \\ 4 \\ 12 \end{bmatrix}$

Solve for each variable.

16) $x\begin{bmatrix} 2 & -5 \\ 7 & y \end{bmatrix} = \begin{bmatrix} 8 & -20 \\ z & 24 \end{bmatrix}$

17) $5\begin{bmatrix} x & y+2 \\ 6 & z \end{bmatrix} = \begin{bmatrix} 10 & 25 \\ 2z & 30x+5y \end{bmatrix}$