Name: _____ Date:_____ Period: _____

ICM - Unit 4 Review - Matrices

Solve for x and y.

1) $2\begin{bmatrix} -1 & x \\ 8 & -4 \end{bmatrix} - \begin{bmatrix} 1 & -7 \\ 5 & 0 \end{bmatrix} = \begin{bmatrix} -3 & 21 \\ 11 & y \end{bmatrix}$

2) $x\begin{bmatrix} 2 & y \\ -7 & 5 \end{bmatrix} + \begin{bmatrix} 2 & 3 \\ 7 & 19 \end{bmatrix} = \begin{bmatrix} x & 3 \\ 21 & 9 \end{bmatrix}$

The dimensions of Matrix *A* and Matrix *B* are listed. What are the dimensions of the product of *AB*? If it is not possible, then write "undefined."

Find the product of the two matrices. SHOW YOUR WORK and box your final answer.

5) $\begin{bmatrix} -1 & -4 \\ 5 & -3 \end{bmatrix}\begin{bmatrix} 1 & 1 & 1 \\ 4 & 3 & 1 \end{bmatrix}$

3) Matrix *A*: 1 x 7
   Matrix *B*: 1 x 7

   Matrix *AB*: _____ x _____

4) Matrix *A*: 3 x 4
   Matrix *B*: 4 x 2

   Matrix *AB*: _____ x _____

For 6-7, solve for the variables x and y. SHOW YOUR WORK!

6) $\begin{bmatrix} -1 & -1 \\ 4 & x \end{bmatrix} \cdot \begin{bmatrix} y & 4 \\ -6 & -2 \end{bmatrix} = \begin{bmatrix} 12 & -2 \\ -36 & 12 \end{bmatrix}$

7) $\begin{bmatrix} -6 & y \end{bmatrix} \cdot \begin{bmatrix} x & 4 \\ 2 & 5 \end{bmatrix} = \begin{bmatrix} -34 & -49 \end{bmatrix}$

Simplify. Write "undefined" for expressions that are undefined.

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

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

10) $\begin{bmatrix} -3 & -4 & 4 \end{bmatrix} - \left(\begin{bmatrix} 6 & -2 & -3 \end{bmatrix} - \begin{bmatrix} -1 & 2 & -5 \end{bmatrix} \right)$

11) Solve: $C + \begin{bmatrix} -9 \\ -9 \\ -6 \end{bmatrix} = \begin{bmatrix} -9 \\ -7 \\ 4 \end{bmatrix}$

12) Solve: $-2B + \begin{bmatrix} -1 \\ 9 \\ 7 \end{bmatrix} = \begin{bmatrix} 13 \\ -5 \\ -3 \end{bmatrix}$

13) Find the inverse of the 2x2 matrix. Show your work.
$$\begin{bmatrix} -5 & 8 \\ -4 & 6 \end{bmatrix}$$

14) Solve the matrix equation with a graphing calculator.

$$\begin{bmatrix} 1 & -4 \\ 3 & -8 \end{bmatrix} X = \begin{bmatrix} -7 \\ -5 \end{bmatrix}$$

15) Solve the system using a matrix equation. Set up the matrices in the space below, then use a calculator to solve it.
$$z = -3x + 3y + 11$$
$$-3x + 7y - 7z = 3$$
$$-2x + 2y - 6z = 30$$

16) Nancy asked the students in two chemistry classes how many students went to a movie, went to a concert, or went shopping last weekend. She recorded the results in two matrices. Find the total for the two classes.

$$\begin{array}{c} \\ \text{Males} \\ \text{Females} \end{array} \begin{array}{ccc} M & C & S \\ \begin{bmatrix} 6 & 2 & 2 \\ 0 & 3 & 8 \end{bmatrix} \end{array} \qquad \begin{array}{c} \\ \text{Males} \\ \text{Females} \end{array} \begin{array}{ccc} M & C & S \\ \begin{bmatrix} 4 & 1 & 1 \\ 3 & 5 & 4 \end{bmatrix} \end{array}$$

17) The first number multiplied by 2 is the opposite of the second number. The third number is subtracted from the product of the second number and 3 to get 20. The sum of the first and third numbers is -5. Use a matrix equation to solve for these three numbers.

18) A company stocks items A, B, and C at each of its two stores. Use matrix multiplication to determine the value of the inventory at each store if item A costs $10, item B costs $8, and item C costs $7. Write your answer in a matrix with appropriate labels for the rows and columns.

$$\begin{array}{c} \\ \text{Store 1} \\ \text{Store 2} \end{array} \begin{array}{ccc} \multicolumn{3}{c}{\text{Inventory}} \\ \text{Item } A & \text{Item } B & \text{Item } C \\ \begin{bmatrix} 7 & 9 & 8 \\ 10 & 5 & 9 \end{bmatrix} \end{array}$$