

ICM - 4.1 Exercises

Matrix Basics Worksheet

Name _____

* Show all work for full credit.

Period ____ Date _____

State the dimensions of the following matrices.

$$1) \begin{bmatrix} 3 & -2 & 7 & 9 \\ 1 & 0 & -3 & 5 \\ -8 & 2 & 10 & -6 \end{bmatrix}$$

$$2) [5 \quad -7 \quad -2 \quad 1]$$

$$3) \begin{bmatrix} 9 \\ 6 \\ 5 \end{bmatrix}$$

$$4) \begin{bmatrix} 6 & 8 & -17 \\ -7 & -5 & 15 \\ 1 & 14 & 2 \\ 11 & 13 & -3 \end{bmatrix}$$

Perform the indicated operations:

$$5) 3 \begin{bmatrix} 5 & -6 & 3 \\ 0 & -4 & 8 \\ 10 & -11 & 12 \end{bmatrix} - 2 \begin{bmatrix} 2 & -4 & 0 \\ 5 & 11 & -2 \\ 5 & 0 & -10 \end{bmatrix}$$

$$6) \begin{bmatrix} -2 & 8 \\ -11 & 5 \end{bmatrix} + 3 \begin{bmatrix} 5 & 3 & -11 \\ 44 & 0 & 5 \\ -3 & 2 & 8 \end{bmatrix}$$

Solve for x and/or y:

$$* 7) \begin{bmatrix} -3 & 5 \\ 25 & -2 \end{bmatrix} - 3 \begin{bmatrix} 0 & -2 \\ x & 4 \end{bmatrix} = \begin{bmatrix} -3 & 11 \\ 15 & -14 \end{bmatrix}$$

$$* 8) -5 \begin{bmatrix} 5 & 6 \\ 10 & -7 \\ 8 & x \\ 1 & -6 \\ 7 & 8 \end{bmatrix} + 4 \begin{bmatrix} 0 & 1 \\ 1 & -2 \\ 2 & 3 \\ 4 & 11 \\ -5 & 3 \end{bmatrix} = 2 \begin{bmatrix} 12.5 & -13 \\ -23 & 13.5 \\ -16 & 100 \\ y & 37 \\ -27.5 & -14 \end{bmatrix}$$

Matrix A represents the number of points scored in each quarter for the first 4 games of football played by Frederick High School. Matrix B represents the number of points scored in each quarter for the first 4 games of football played by Thomas Johnson High School.

	Matrix A			
	Q1	Q2	Q3	Q4
Game 1	6	0	13	3
Game 2	21	18	0	7
Game 3	14	28	6	0
Game 4	0	0	35	17

	Matrix B			
	Q1	Q2	Q3	Q4
Game 1	0	3	9	0
Game 2	7	14	7	6
Game 3	3	9	12	17
Game 4	23	0	9	7

9) Write a matrix that represents the combined points scored per quarter for the first 4 games.

10) A toymaker makes handcrafted toys for children. His output last year is represented by the matrix M below.

$$\begin{array}{l} \text{dolls} \\ \text{stuffed animals} \end{array} \begin{array}{c} \text{sm} \quad \text{med} \quad \text{lg} \\ \left[\begin{array}{ccc} 5 & 10 & 18 \\ 12 & 22 & 9 \end{array} \right] = M$$

a) Suppose he wants to increase his output by 30%. Write a matrix that represents the needed output.

b) Find $2M$ and explain what the matrix represents.

Matrix Multiplication Worksheet

Name _____

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Period ____ Date _____

Find the product. If the product is not defined, state the reason.

1) $[3 \ -1] \begin{bmatrix} 5 \\ 7 \end{bmatrix}$

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

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

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

5) $\begin{bmatrix} 1 & 3 & 0 \\ 2 & 12 & -4 \end{bmatrix} \begin{bmatrix} 9 & 1 \\ 4 & -3 \\ -2 & 4 \end{bmatrix}$

Solve for the variables.

* 6) $\begin{bmatrix} -2 & 1 & 2 \\ 3 & 2 & 4 \\ 0 & -2 & 4 \end{bmatrix} \begin{bmatrix} 1 \\ x \\ 3 \end{bmatrix} = \begin{bmatrix} 6 \\ 19 \\ y \end{bmatrix}$

* 7) $\begin{bmatrix} 4 & 1 & 3 \\ -2 & x & 1 \end{bmatrix} \begin{bmatrix} 9 & -2 \\ 2 & 1 \\ -1 & 1 \end{bmatrix} = \begin{bmatrix} y & -4 \\ -13 & 8 \end{bmatrix}$