

Day 1 Homework
ICM - 4.1 Exercises

Matrix Basics Worksheet

Name Key

* Show all work for full credit.

Period _____ Date _____

State the dimensions of the following matrices.

1) $\begin{bmatrix} 3 & -2 & 7 & 9 \\ 1 & 0 & -3 & 5 \\ -8 & 2 & 10 & -6 \end{bmatrix}$ 3×4

2) $[5 \ -7 \ -2 \ 1]$ 1×4

3) $\begin{bmatrix} 9 \\ 6 \\ 5 \end{bmatrix}$ 3×1

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

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

$$\begin{bmatrix} 11 & -10 & 9 \\ -10 & -34 & 28 \\ 20 & -33 & 56 \end{bmatrix}$$

$$\begin{bmatrix} -2 & 8 \\ -11 & 5 \end{bmatrix} + \begin{bmatrix} 15 & 9 & -33 \\ 132 & 0 & 15 \\ -9 & 6 & 24 \end{bmatrix}$$

Solve for x and/or y:

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

$$25 - 3x = 15$$

$$-3x = -10$$

$$x = 10/3$$

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

$$-5x + 4(3) = 2(100) \quad -5 + 16 = 2y$$

$$-5x + 12 = 200$$

$$11 = 2y$$

$$-5x = 188$$

$$y = 5.5$$

$$x = -37.6$$

Matrix Multiplication Worksheet

Name _____

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Period ____ Date ____

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

$$1) [3 \ -1] \begin{bmatrix} 5 \\ 7 \end{bmatrix} \quad \underbrace{1 \times 2 \cdot 2 \times 1}$$

$$= [8]$$

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

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

$$\begin{bmatrix} -12 & 15 \\ 8 & -4 \end{bmatrix}$$

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

$$\begin{bmatrix} 11 & 35 \\ 8 & 0 \\ -9 & 7 \end{bmatrix}$$

$$5) \begin{bmatrix} 1 & 3 & 0 \\ 2 & 12 & -4 \end{bmatrix} \begin{bmatrix} 9 & 1 \\ 4 & -3 \\ -2 & 4 \end{bmatrix} = \begin{bmatrix} 21 & -8 \\ 74 & -50 \end{bmatrix}$$

$$\underbrace{2 \times 3 \cdot 3 \times 2}$$

Solve for the variables.

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

$$\begin{bmatrix} x+4 \\ 2x+15 \\ -2x+12 \end{bmatrix} = \begin{bmatrix} 6 \\ 19 \\ y \end{bmatrix}$$

$$x+4=6 \quad -2(2)+12=y$$

$$x=2 \quad -4+12=y$$

$$8=y$$

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

$$\begin{bmatrix} 35 & -4 \\ 2x-19 & x+5 \end{bmatrix} = \begin{bmatrix} y & -4 \\ -13 & 8 \end{bmatrix}$$

$$x+5=8 \quad y=-4$$

$$x=3$$