

Section 11.4a

Add/ Subtract/ Scalar Multiplication of Matrices

Tests, Homework, State Exam

OBJECTIVE 1

- 1 ✓ Find the Sum and Difference of Two Matrices

EXAMPLE**Examples of Matrices***Row by Column*

$$(a) \begin{bmatrix} 5 & 0 \\ -6 & 1 \end{bmatrix} \quad 2 \times 2$$

$$(b) [1 \quad 0 \quad 3] \quad 1 \times 3$$

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

EXAMPLE**Adding and Subtracting Matrices**

$$A = \begin{bmatrix} 1 & -2 & 2 \\ 0 & -1 & 3 \end{bmatrix} \text{ and } B = \begin{bmatrix} -3 & 0 & 4 \\ 2 & 1 & -4 \end{bmatrix}$$

2×3 2×3

Find: (a) $A + B$

(b) $A - B$

$$\begin{bmatrix} -2 & -2 & 6 \\ 2 & 0 & -1 \end{bmatrix}$$

$$\begin{bmatrix} 4 & -2 & -2 \\ -2 & -2 & 7 \end{bmatrix}$$

$$\begin{bmatrix} 1 & -2 & 2 \\ 0 & -1 & 3 \end{bmatrix} + \begin{bmatrix} 0 & -2 & 3 \\ 1 & 2 & 1 \end{bmatrix}$$

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

OBJECTIVE 2

- 2 Find Scalar Multiples of a Matrix

$$3 \begin{bmatrix} 4 & -5 \\ 0 & 2 \end{bmatrix}$$

2x2

||

$$\begin{bmatrix} 12 \\ 0 \end{bmatrix}$$

$$\begin{bmatrix} -15 \\ 6 \end{bmatrix}$$

$$A = \begin{bmatrix} 0 & -1 & 3 \end{bmatrix} \quad B = \begin{bmatrix} 1 & 2 & 1 \end{bmatrix} \quad C = \begin{bmatrix} 0 & -4 \end{bmatrix}$$

Find: (a) $4A$ (b) $\frac{1}{3}C$ (c) $3A - 2B$

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

$$\begin{bmatrix} 0 & -4 & 12 \end{bmatrix}$$

$$\frac{1}{3} \begin{bmatrix} 0 & -4 \end{bmatrix}$$

$$\begin{bmatrix} 0 & -\frac{4}{3} \end{bmatrix}$$

$$3 \begin{bmatrix} 0 & -1 & 3 \end{bmatrix}$$

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

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

$$-2 \begin{bmatrix} 1 & 2 & 1 \end{bmatrix}$$

$$\begin{bmatrix} -2 & -4 & -2 \end{bmatrix}$$

Matrix Multiplication

$$\begin{bmatrix} 2 & 3 & 1 \\ 2 & -7 & 4 \end{bmatrix} \cdot \begin{bmatrix} 3 & 4 & 5 \\ 1 & 1 & 4 \\ 2 & 1 & 4 \end{bmatrix}$$