2-6

Name _____ Date _____

Matrices (Pages 73–76)

One way to organize information is by using a **matrix**. A matrix is a rectangular arrangement of numbers in rows and columns. Each number in a matrix is called an **element** of the matrix.

Adding and Subtracting Matrices	• You can add or subtract matrices that have the same number of rows and the same number of columns. • Add or subtract matrices by adding or subtracting the corresponding elements.

EXAMPLES

A Find the sum $\begin{bmatrix} 2 & 0 & -1 \\ 1 & -2 & 3 \end{bmatrix} + \begin{bmatrix} 1 & 5 & 1 \\ -1 & 3 & 4 \end{bmatrix}$.

Both matrices have 2 rows and 3 columns, so you can add them by adding the corresponding elements.

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

B Find the sum $\begin{bmatrix} 2 & 1 \\ 3 & 0 \\ 5 & 6 \end{bmatrix} + \begin{bmatrix} 3 & 1 & 0 \\ 2 & 0 & -1 \end{bmatrix}$.

The first matrix has 3 rows and 2 columns, but the second matrix has 2 rows and 3 columns. It is impossible to add these matrices.

Try These Together

1. Find the sum or write *impossible*.

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

HINT: 5 + 1 = 6, 2 + 0 = 2, and so on.

2. Find the difference or write *impossible*.

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

HINT: Do these matrices have matching numbers of rows and columns?

PRACTICE

***Find each sum or difference. If there is no sum or difference, write* impossible.**

3. $\begin{bmatrix} 1 & 5 \\ -8 & -1 \end{bmatrix} - \begin{bmatrix} -3 & 2 \\ 2 & -4 \end{bmatrix}$

4. $\begin{bmatrix} 2 & 8 \\ 9 & 11 \end{bmatrix} + [3 \;\; 7 \;\; 15]$

5. Population The table shows the populations of Montana and Idaho in 1950, 1970, and 1990. Write a matrix for the data.

Population (thousands)		
Year	**Montana**	**Idaho**
1950	591.0	588.6
1970	694.4	713.0
1990	799.1	1,006.7

6. **Standardized Test Practice** Find the sum of $\begin{bmatrix} 8 & -3 & 5 \\ 0 & -1 & 2 \end{bmatrix}$ and $\begin{bmatrix} 3 & 6 & -7 \\ -8 & 5 & 3 \end{bmatrix}$.

A $\begin{bmatrix} 11 & 3 & -2 \\ -8 & 4 & 5 \end{bmatrix}$ **B** $\begin{bmatrix} 5 & -9 & 12 \\ 8 & -6 & -1 \end{bmatrix}$ **C** $\begin{bmatrix} -11 & -3 & 2 \\ 18 & 6 & 1 \end{bmatrix}$ **D** $\begin{bmatrix} -5 & 9 & -12 \\ -18 & 4 & 5 \end{bmatrix}$

Answers: **1–3.** See Answer Key. **4.** impossible **5.** See Answer Key. **6.** A