ACTIVITY 4.1

Using Technology

Using Matrix Operations

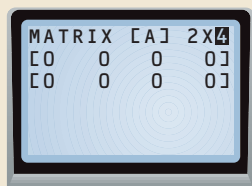**You can use a graphing calculator to perform matrix operations.**

▶ EXAMPLE

The matrices show music sales (in thousands) for a chain of stores during a two-month period. The music formats are CDs and cassette tapes. The categories of music are Rock (R), Country (C), Jazz (J), and Easy Listening (E).

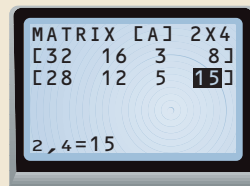|	**MAY**				**JUNE**			
	R	C	J	E	R	C	J	E
CDs	32	16	3	8	24	15	3	7
Tapes	28	12	5	15	25	10	4	15

a. Find the total sales for each format and category for May and June.

b. Estimate the sales for July if they are expected to decrease 3% from the June sales.
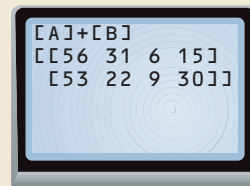
▶ SOLUTION

a. To find the total sales in each format and category for May and June, let matrix A represent May sales and let matrix B represent June sales. Use a graphing calculator to enter each matrix. Then find the sum of matrix A and matrix B.

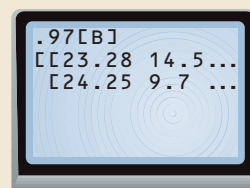**For each matrix, enter the dimensions of the matrix.**

Then enter the data row by row until all 8 entries have been filled for each matrix.

To find the sum, select each matrix from the matrix menu and add.

b. To estimate the sales for July, multiply matrix B by the scalar 0.97. The calculator shows, for instance, that July sales for rock CDs are expected to be 23,280.

▶ EXERCISES

Use a graphing calculator to perform the indicated operation(s).

1. $\begin{bmatrix} -4.9 & 3.1 \\ 9.3 & -2.5 \end{bmatrix} + \begin{bmatrix} 11.5 & -9.2 \\ 6.03 & 4.22 \end{bmatrix}$

2. $\begin{bmatrix} 418 & 418 \\ 452 & 452 \\ 146 & 146 \end{bmatrix} - \begin{bmatrix} 512 & 359 \\ 428 & 184 \\ 735 & 299 \end{bmatrix}$

3. $1.043 \begin{bmatrix} 6.2 & 1.6 \\ 22.1 & 7 \end{bmatrix}$

4. $5.08 \begin{bmatrix} 0.06 & 1.25 \\ 3.32 & 0.01 \end{bmatrix} - 0.07 \begin{bmatrix} 1.009 & 0.052 \\ 11.2 & 34.15 \end{bmatrix}$

5. 🌎 **MUSIC** Write a matrix that gives the change in sales from May to June for the chain of stores discussed in the example. For which categories of CDs and cassettes did sales increase from May to June? For which did sales decrease?