

EXERCISES

For more practice, see *Extra Practice*.

Practice and Problem Solving

A Practice by Example

Example 1
(page 164)

State the dimensions of each matrix.

1. $\begin{bmatrix} 4 & -2 & 2 \\ 1 & 4 & 1 \\ 0 & 5 & -7 \end{bmatrix}$

2. $\begin{bmatrix} 1 \\ -9 \\ 5 \end{bmatrix}$

3. $[2 \quad \sqrt{5}]$

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

5. $\begin{bmatrix} 2.5 \\ -3 \\ -1.6 \\ 10.0 \end{bmatrix}$

Refer to matrices A and B at the right.

Identify each matrix element.

$$A = \begin{bmatrix} 0 & -1 \\ 1.5 & 3 \\ 7 & -2 \end{bmatrix} \quad B = \begin{bmatrix} 6 & -3 & \frac{1}{2} \end{bmatrix}$$

6. a_{21}

7. b_{12}

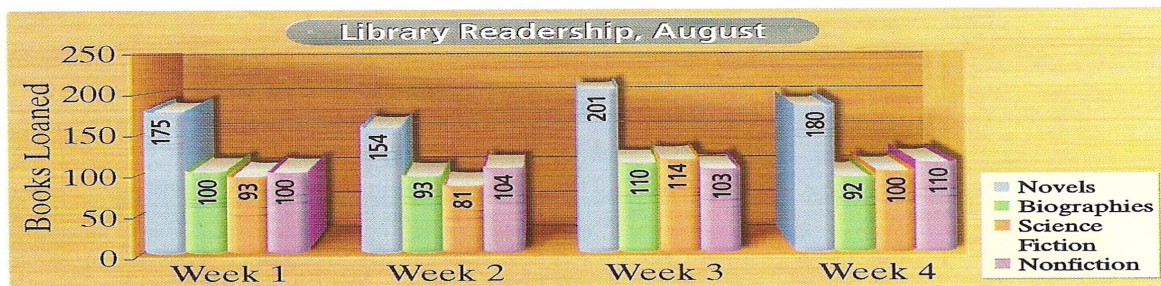
8. a_{31}

9. b_{13}

10. a_{32}

11. a_{12}

Use the graph below for Exercises 12 and 13.



12. Write a matrix to represent the data. Label the rows and columns.

13. Write a different matrix to represent the data. Label the rows and columns.

14. a. Write a matrix H to represent the data in the table below.

b. Find element h_{23} . What does this element represent?

Technology in Public Schools (millions)

Type of School	Videodisc Players	Modems	Networks	CD-ROMs
Elementary	25.9	35.1	26.4	37.9
Junior High	9.2	11.0	9.0	11.0
Senior High	10.7	14.5	12.9	14.0

SOURCE: Quality Education Data

Use the table below for Exercises 15–17.

15. Display the data in a matrix A with columns indicating years. Identify a_{23} and tell what it represents.

U.S. Households with Color TVs and VCRs (millions)

	1980	1985	1990	1992	1995	1997
Color TVs	63	78	90	91	94	97
VCRs	1	18	63	69	77	82

SOURCE: Nielsen Media Research

16. Display the data in a matrix A with rows indicating years. Identify a_{41} and tell what it represents.

17. State the dimensions of the matrices in Exercises 15 and 16.

18. **Error Analysis** A student identified element g_{32} from matrix G at the right as -3 . What was the student's error?

$$G = \begin{bmatrix} 3 & 2.5 & 4.5 \\ 1.5 & 0 & -3 \\ -3 & 4.5 & 1.5 \end{bmatrix}$$

30. Which element in matrix $A = \begin{bmatrix} 5 & -2 & -\frac{1}{2} & 0 \end{bmatrix}$ is the number 0?

A. a_{40}

B. a_4

C. a_{14}

D. a_{41}

31. In which matrix is the value of a_{32} less than the value of a_{21} ?

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

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

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

I. $\begin{bmatrix} 0 & -1 & 5 \\ 0 & 3 & 4 \\ -3 & 1 & 6 \end{bmatrix}$