Chapter Standardized Test

▶ **TEST-TAKING STRATEGY** During a test it is important to stay mentally focused, but also physically relaxed. If you start to get tense, put your pencil down and take some deep breaths. This may help you regain control.

1. MULTIPLE CHOICE Which matrix equals

$$2\left(\begin{bmatrix} 2 & -7 \\ -4 & 3 \end{bmatrix} + \begin{bmatrix} 0 & -5 \\ -3 & 6 \end{bmatrix}\right)?$$

Ⓐ $\begin{bmatrix} 4 & -4 \\ -2 & 18 \end{bmatrix}$ Ⓑ $\begin{bmatrix} 4 & -24 \\ -14 & 18 \end{bmatrix}$

Ⓒ $\begin{bmatrix} 6 & -22 \\ -12 & 20 \end{bmatrix}$ Ⓓ $\begin{bmatrix} -24 & 60 \\ -6 & 30 \end{bmatrix}$

Ⓔ $\begin{bmatrix} 42 & -104 \\ -18 & 76 \end{bmatrix}$

2. MULTIPLE CHOICE What are the values of x and y in the matrix equation?

$$2x\begin{bmatrix} -2 & -1 \\ -10 & 5 \end{bmatrix} = \begin{bmatrix} -16 & -8 \\ y & 40 \end{bmatrix}$$

Ⓐ $x = 8, y = -80$ Ⓑ $x = -4, y = -80$

Ⓒ $x = 4, y = 80$ Ⓓ $x = 4, y = -80$

Ⓔ $x = 2, y = -40$

3. MULTIPLE CHOICE What is the product of

$$\begin{bmatrix} -1 & 0 & 4 \\ -2 & 1 & 3 \\ 3 & 2 & -1 \end{bmatrix} \text{ and } \begin{bmatrix} 1 & -2 \\ 0 & 1 \\ 5 & -1 \end{bmatrix}?$$

Ⓐ $\begin{bmatrix} 19 & -2 \\ 13 & 2 \\ -2 & -3 \end{bmatrix}$ Ⓑ $\begin{bmatrix} 19 & -2 \\ 13 & -6 \\ -2 & -3 \end{bmatrix}$

Ⓒ $\begin{bmatrix} 19 & -2 \\ 13 & 2 \\ -2 & -7 \end{bmatrix}$ Ⓓ $\begin{bmatrix} 19 & -2 \\ 13 & 2 \\ 2 & -3 \end{bmatrix}$

Ⓔ $\begin{bmatrix} 21 & -2 \\ 13 & 8 \\ -2 & -3 \end{bmatrix}$

4. MULTIPLE CHOICE What is the determinant of

$$\begin{bmatrix} 2 & 1 & 5 \\ -3 & -1 & 2 \\ 0 & 4 & -2 \end{bmatrix}?$$

Ⓐ -78 Ⓑ -34 Ⓒ -16

Ⓓ 34 Ⓔ 78

5. MULTIPLE CHOICE What is the inverse of

$$\begin{bmatrix} 9 & -5 \\ 7 & -4 \end{bmatrix}?$$

Ⓐ $\begin{bmatrix} 4 & -5 \\ -7 & -9 \end{bmatrix}$ Ⓑ $\begin{bmatrix} -4 & 5 \\ 7 & 9 \end{bmatrix}$

Ⓒ $\begin{bmatrix} -4 & -5 \\ -7 & -9 \end{bmatrix}$ Ⓓ $\begin{bmatrix} 4 & -5 \\ 7 & -9 \end{bmatrix}$

Ⓔ $\begin{bmatrix} -4 & 5 \\ -7 & 9 \end{bmatrix}$

6. MULTIPLE CHOICE Which matrix has no inverse?

Ⓐ $\begin{bmatrix} 6 & 0 \\ 0 & 5 \end{bmatrix}$ Ⓑ $\begin{bmatrix} 4 & 6 \\ -6 & -9 \end{bmatrix}$

Ⓒ $\begin{bmatrix} -2 & 4 \\ 3 & 6 \end{bmatrix}$ Ⓓ $\begin{bmatrix} 1 & 1 \\ 0 & 1 \end{bmatrix}$

Ⓔ $\begin{bmatrix} -4 & 4 \\ 2 & 1 \end{bmatrix}$

7. MULTIPLE CHOICE What is the area of the triangle in square units?

Ⓐ 40 Ⓑ 30 Ⓒ 26
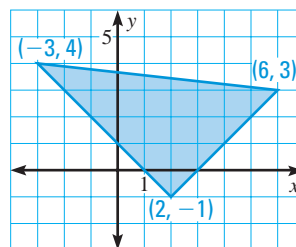
Ⓓ 20 Ⓔ 13

8. MULTIPLE CHOICE What is the solution of the linear system?

$$7x + 5y = 6$$
$$4x + 3y = 3$$

Ⓐ $x = 3, y = 3$ Ⓑ $x = -3, y = -3$

Ⓒ $x = 3, y = -3$ Ⓓ $x = -3, y = 3$

Ⓔ $x = 8, y = -10$

9. QUANTITATIVE COMPARISON Choose the statement that is true about the given quantities.

- (A) The quantity in column A is greater.
- (B) The quantity in column B is greater.
- (C) The two quantities are equal.
- (D) The relationship cannot be determined from the given information.

Column A	Column B
$\det \begin{bmatrix} 0 & 1 \\ -8 & 2 \end{bmatrix}$	$\det \begin{bmatrix} -2 & -1 \\ 3 & 5 \end{bmatrix}$

10. MULTI-STEP PROBLEM The School Spirit club ordered shirts to sell at basketball games. The number of each size and type of shirt they ordered is shown in the matrix at the right.

FUNDRAISING

	T-shirt	Sweatshirt
S	25	20
M	25	20
L	100	40
XL	50	20

a. At the first basketball game the club sold 17 T-shirts (4 small, 5 medium, 6 large, and 2 extra large) and 12 sweatshirts (3 medium, 5 large, and 4 extra large). Write a matrix that gives the number of each size and type of shirt sold at the game. Then write a matrix that shows the number of shirts left.

b. The wholesale price of a T-shirt is $8, and the club sells them for $10 each. The wholesale price of a sweatshirt is $20, and the club sells them for $25 each. Write a row matrix for the number of each type of shirt (T-shirt or sweatshirt) sold at the game from part (a). Write a column matrix for the profit on each type of shirt. Multiply the row matrix by the column matrix and interpret the result.

11. MULTI-STEP PROBLEM You and a friend are planning a secret meeting. You agree that $A = \begin{bmatrix} 1 & 1 \\ 1 & 2 \end{bmatrix}$ will be your coding matrix. Use the coding information on pages 225 and 226.

a. Use matrix A to encode the message SATURDAY.

b. Use the inverse of A to decode your answer to part (a).

c. Your friend replied with the message below. Use the inverse of A to decode it.

34, 49, 6, 9, 23, 41, 6, 12, 14, 19, 16, 20

d. Use matrix A to encode your answer to part (c).

12. MULTI-STEP PROBLEM Use the following linear system.

$$x - 2y = 1$$
$$3x - 5y = 4$$

a. Use Cramer's rule to solve the system.

b. Use inverse matrices to solve the system.

c. Use the substitution or linear combination method to solve the system.

d. Solve the system by graphing. Label the solution on your graph.

e. *Writing* Which method do you prefer for solving this linear system?