

## Algebra 2 Matrices Review

### Multiple Choice

Identify the choice that best completes the statement or answers the question.

- \_\_\_ 1. Find  $7A + 6B$ .

$$A = \begin{bmatrix} 1 & -1 \\ 0 & -3 \\ 5 & 2 \end{bmatrix} \quad B = \begin{bmatrix} -2 & 1 \\ 5 & 4 \\ 0 & -7 \end{bmatrix}$$

Evaluate the determinant of the matrix.

\_\_\_ 2.  $\begin{vmatrix} -5 & -5 & 4 \\ -5 & 4 & -1 \\ 0 & 3 & -1 \end{vmatrix}$

- \_\_\_ 3. A matrix contains 48 elements. Which of the following *cannot* equal the number of rows of the matrix?

Use Cramer's Rule to solve the system.

\_\_\_ 4. 
$$\begin{cases} 1.5x - 0.5y = -3.5 \\ 1.5x + 1.5y = -7.5 \end{cases}$$

Identify the given matrix element.

- \_\_\_ 5.  $a_{2,3}$

$$\begin{bmatrix} -1 & 2 & 5 & 0 \\ -5 & 0 & -6 & 7 \\ 9 & 9 & 2 & -1 \\ 8 & -5 & 0 & -7 \end{bmatrix}$$

- \_\_\_ 6.  $a_{2,1}$

$$\begin{bmatrix} -1 & 2 & 5 & 3 \\ -5 & 0 & 4 & 7 \\ 9 & 6 & -3 & -1 \\ 8 & -5 & -2 & 1 \end{bmatrix}$$

**Solve the system.**

\_\_\_\_\_ 7. 
$$\begin{cases} -3x + 10y = 3 \\ x - 3y = -3 \end{cases}$$

\_\_\_\_\_ 8. 
$$\begin{cases} 4x + 2y - z = 6 \\ 2x + 3y - 2z = 5 \\ -4x + 4y + 2z = 0 \end{cases}$$

**Find the product.**

\_\_\_\_\_ 9. 
$$\begin{bmatrix} -7 & 6 \\ 1 & 6 \end{bmatrix} \begin{bmatrix} -4 & 1 \\ -4 & 3 \end{bmatrix}$$

\_\_\_\_\_ 10. 
$$\begin{bmatrix} 0 & 0 & -2 \end{bmatrix} \begin{bmatrix} -1 \\ -5 \\ -1 \end{bmatrix}$$

\_\_\_\_\_ 11. 
$$-4 \begin{bmatrix} 7 & -4 & 0 \\ -3 & 0 & 5 \\ 6 & 2 & 1 \end{bmatrix}$$

**Use matrices  $A$ ,  $B$ , and  $C$ . Find the sum or difference if you can.**

$$A = \begin{bmatrix} -5 & 4 \\ -8 & 2 \end{bmatrix} \quad B = \begin{bmatrix} -2 & 7 & -3 \\ 1 & -6 & 0 \end{bmatrix} \quad C = \begin{bmatrix} 5 & 3 & -1 \\ -3 & 0 & 6 \end{bmatrix}$$

\_\_\_\_\_ 12.  $C + A$

\_\_\_\_\_ 13.  $C + B$

\_\_\_\_\_ 14. State the dimensions of the matrix. Identify the indicated element.

$$A = \begin{bmatrix} -9 & 1 \\ -7 & 5 \\ -5 & 8 \end{bmatrix}, a_{2,1}$$

**Solve the matrix equation.**

\_\_\_\_\_ 15.  $\begin{bmatrix} 1 & 1 \\ 2 & 1 \end{bmatrix} X = \begin{bmatrix} 6 & 6 \\ 2 & 4 \end{bmatrix}$

\_\_\_\_\_ 16.  $X - 4 \begin{bmatrix} 2 & -8 \\ -4 & 2 \end{bmatrix} = \begin{bmatrix} 4 & -6 \\ 2 & -8 \end{bmatrix}$

\_\_\_\_\_ 17.  $X + \begin{bmatrix} 2 & 5 & 8 \\ 2 & 3 & 0 \end{bmatrix} = \begin{bmatrix} 6 & -1 & -7 \\ -5 & 2 & 7 \end{bmatrix}$

**Find the values of the variables.**

\_\_\_\_\_ 18.  $\begin{bmatrix} -14 & -w^2 \\ 3f & 3 \end{bmatrix} = \begin{bmatrix} 2k & -81 \\ -3 & 3 \end{bmatrix}$

\_\_\_\_\_ 19.  $\begin{bmatrix} -6 - t & 0 \\ 8 & -5 \end{bmatrix} = \begin{bmatrix} -5 & 0 \\ 8 & -3y - 2 \end{bmatrix}$

**Evaluate the determinant.**

\_\_\_ 20.  $\begin{vmatrix} -10 & 10 \\ 5 & -7 \end{vmatrix}$

**Find the sum or difference.**

\_\_\_ 21.  $\begin{bmatrix} 0 & -1 & 7 \\ 0 & 6 & 2 \end{bmatrix} + \begin{bmatrix} -2 & 0 & -2 \\ -3 & 5 & -1 \end{bmatrix}$

\_\_\_ 22.  $\begin{bmatrix} 7 & 2 & 0 \\ -5 & 9 & 9 \end{bmatrix} - \begin{bmatrix} -1 & 3 & 8 \\ 3 & 4 & 7 \end{bmatrix}$

\_\_\_ 23. Suppose  $A$  and  $B$  are  $2 \times 1$  matrices. Which of the following are the dimensions of the matrix  $A + B$ ?

## Algebra 2 Matrices Review Answer Section

### MULTIPLE CHOICE

- ANS: D                   PTS: 1                   DIF: L2                   REF: 4-3 Matrix Multiplication  
OBJ: 4-3.1 Multiplying a Matrix by a Scalar                   STA: MS AII 7d  
TOP: 4-3 Example 2                   KEY: scalar multiplication | matrix subtraction | matrix
- ANS: C                   PTS: 1                   DIF: L2  
REF: 4-6 3 x 3 Matrices, Determinants, and Inverses  
OBJ: 4-6.1 Evaluating Determinants of 3 x 3 Matrices                   STA: MS AII 7b  
TOP: 4-6 Example 1                   KEY: determinant | 3 x 3 matrix | matrix
- ANS: A                   PTS: 1                   DIF: L4                   REF: 4-1 Organizing Data Into Matrices  
OBJ: 4-1.1 Identifying Matrices                   STA: MS AII 7a  
KEY: matrix | dimensions of a matrix | matrix element
- ANS: D                   PTS: 1                   DIF: L3  
REF: 4-8 Augmented Matrices and Systems  
OBJ: 4-8.1 Solving Systems Using Cramer's Rule                   STA: MS AII 2a  
TOP: 4-8 Example 1                   KEY: Cramer's Rule | systems and matrices | 2 x 2 matrix
- ANS: D                   PTS: 1                   DIF: L2                   REF: 4-1 Organizing Data Into Matrices  
OBJ: 4-1.1 Identifying Matrices                   STA: MS AII 7a                   TOP: 4-1 Example 2  
KEY: matrix | matrix element
- ANS: D                   PTS: 1                   DIF: L2                   REF: 4-1 Organizing Data Into Matrices  
OBJ: 4-1.1 Identifying Matrices                   STA: MS AII 7a                   TOP: 4-1 Example 2  
KEY: matrix | matrix element
- ANS: C                   PTS: 1                   DIF: L2                   REF: 4-7 Inverse Matrices and Systems  
OBJ: 4-7.1 Solving Systems of Equations Using Inverse Matrices  
STA: MS AII 2a                   TOP: 4-7 Example 2  
KEY: systems and matrices | 2 x 2 matrix | matrix equation
- ANS: A                   PTS: 1                   DIF: L2  
REF: 4-8 Augmented Matrices and Systems  
OBJ: 4-8.1 Solving Systems Using Cramer's Rule                   STA: MS AII 2a  
TOP: 4-8 Example 2                   KEY: systems and matrices | 3 x 3 matrix | Cramer's Rule
- ANS: D                   PTS: 1                   DIF: L2                   REF: 4-3 Matrix Multiplication  
OBJ: 4-3.2 Multiplying Matrices                   STA: MS AII 7d                   TOP: 4-3 Example 4  
KEY: matrix multiplication | matrix
- ANS: B                   PTS: 1                   DIF: L3                   REF: 4-3 Matrix Multiplication  
OBJ: 4-3.2 Multiplying Matrices                   STA: MS AII 7d                   TOP: 4-3 Example 4  
KEY: matrix multiplication | matrix
- ANS: B                   PTS: 1                   DIF: L2                   REF: 4-3 Matrix Multiplication  
OBJ: 4-3.1 Multiplying a Matrix by a Scalar                   STA: MS AII 7d  
TOP: 4-3 Example 1                   KEY: scalar | scalar multiplication | matrix
- ANS: D                   PTS: 1                   DIF: L3  
REF: 4-2 Adding and Subtracting Matrices  
OBJ: 4-2.1 Adding and Subtracting Matrices                   STA: MS AII 7c | MS AII 7d  
TOP: 4-2 Example 1  
KEY: matrix addition | dimensions of a matrix | matrix subtraction
- ANS: B                   PTS: 1                   DIF: L2  
REF: 4-2 Adding and Subtracting Matrices

- OBJ: 4-2.1 Adding and Subtracting Matrices                   STA: MS AII 7c | MS AII 7d  
 TOP: 4-2 Example 1  
 KEY: matrix subtraction | dimensions of a matrix | matrix addition
14. ANS: D                   PTS: 1                   DIF: L3                   REF: 4-1 Organizing Data Into Matrices  
 OBJ: 4-1.1 Identifying Matrices                   STA: MS AII 7a       TOP: 4-1 Example 1  
 KEY: matrix | dimensions of a matrix | matrix element
15. ANS: B                   PTS: 1                   DIF: L2  
 REF: 4-5 2 x 2 Matrices, Determinants, and Inverses  
 OBJ: 4-5.2 Using Inverse Matrices to Solve Equations       STA: MS AII 7b  
 TOP: 4-5 Example 4  
 KEY: inverse matrices | matrix | multiplicative inverse of a matrix
16. ANS: D                   PTS: 1                   DIF: L2                   REF: 4-3 Matrix Multiplication  
 OBJ: 4-3.1 Multiplying a Matrix by a Scalar                   STA: MS AII 7d  
 TOP: 4-3 Example 3                   KEY: scalar | scalar multiplication | matrix | matrix equation
17. ANS: D                   PTS: 1                   DIF: L2  
 REF: 4-2 Adding and Subtracting Matrices       OBJ:                   4-2.2 Solving Matrix Equations  
 STA: MS AII 7c | MS AII 7d                   TOP: 4-2 Example 4  
 KEY: matrix equation
18. ANS: D                   PTS: 1                   DIF: L4  
 REF: 4-2 Adding and Subtracting Matrices       OBJ:                   4-2.2 Solving Matrix Equations  
 STA: MS AII 7c | MS AII 7d                   TOP: 4-2 Example 6  
 KEY: matrix | matrix equation | matrix element
19. ANS: D                   PTS: 1                   DIF: L2  
 REF: 4-2 Adding and Subtracting Matrices       OBJ:                   4-2.2 Solving Matrix Equations  
 STA: MS AII 7c | MS AII 7d                   TOP: 4-2 Example 6  
 KEY: matrix | matrix equation | matrix element
20. ANS: B                   PTS: 1                   DIF: L3  
 REF: 4-5 2 x 2 Matrices, Determinants, and Inverses  
 OBJ: 4-5.1 Evaluating Determinants of 2 x 2 Matrices       STA: MS AII 7b  
 KEY: determinant | 2 x 2 matrix | matrix
21. ANS: D                   PTS: 1                   DIF: L2  
 REF: 4-2 Adding and Subtracting Matrices  
 OBJ: 4-2.1 Adding and Subtracting Matrices                   STA: MS AII 7c | MS AII 7d  
 TOP: 4-2 Example 2                   KEY: matrix addition | matrix
22. ANS: B                   PTS: 1                   DIF: L2  
 REF: 4-2 Adding and Subtracting Matrices  
 OBJ: 4-2.1 Adding and Subtracting Matrices                   STA: MS AII 7c | MS AII 7d  
 TOP: 4-2 Example 3                   KEY: matrix subtraction | matrix
23. ANS: A                   PTS: 1                   DIF: L3  
 REF: 4-2 Adding and Subtracting Matrices  
 OBJ: 4-2.1 Adding and Subtracting Matrices                   STA: MS AII 7c | MS AII 7d  
 KEY: matrix addition | matrix