
Algebra 2 - Matrices REVIEW

1. Find the sum of the matrices. $\begin{bmatrix} 7 & -2 \\ 2 & -8 \end{bmatrix} + \begin{bmatrix} -33 & -4 \\ 28 & 11 \end{bmatrix}$

[1] _____

2. Subtract: $\begin{bmatrix} 37 & -28 \\ 7 & -17 \end{bmatrix} - \begin{bmatrix} -36 & -1 \\ 20 & 30 \end{bmatrix}$

[2] _____

3. If $A = \begin{bmatrix} 7 & -1 & -4 \\ -3 & -7 & 2 \\ 5 & 3 & 4 \end{bmatrix}$ and $B = \begin{bmatrix} -9 & -7 & -6 \\ 8 & 1 & 7 \\ -8 & -3 & -1 \end{bmatrix}$, find $A + B$.

[A] $\begin{bmatrix} 16 & 6 & 2 \\ -11 & -8 & 5 \\ 13 & 6 & -5 \end{bmatrix}$

[B] $\begin{bmatrix} -2 & -8 & -10 \\ 5 & -6 & 9 \\ -3 & 0 & 3 \end{bmatrix}$

[C] $\begin{bmatrix} 16 & 6 & 2 \\ -11 & -8 & -5 \\ 13 & 6 & 5 \end{bmatrix}$

[D] $\begin{bmatrix} -2 & -8 & -10 \\ 5 & -6 & 3 \\ -3 & 0 & 9 \end{bmatrix}$

[3] _____

4. If $A = \begin{bmatrix} 4 & -6 \\ 5 & -7 \end{bmatrix}$, find $2A$.

[A] $\begin{bmatrix} 6 & -4 \\ 7 & -5 \end{bmatrix}$

[B] $\begin{bmatrix} 8 & -2 \\ 9 & -3 \end{bmatrix}$

[C] $\begin{bmatrix} 8 & 10 \\ -12 & -14 \end{bmatrix}$

[D] $\begin{bmatrix} 8 & -12 \\ 10 & -14 \end{bmatrix}$

[4] _____

5. Perform the matrix operations, if possible. $5 \begin{bmatrix} 2 & 1 & -5 \\ 6 & -3 & 4 \end{bmatrix}$

[5] _____

6. Solve for x and y . $3 \begin{bmatrix} 4 & x \\ -1 & 3 \end{bmatrix} - 2 \begin{bmatrix} 1 & 3 \\ y & 0 \end{bmatrix} = \begin{bmatrix} 10 & 6 \\ -7 & 9 \end{bmatrix}$

[6] _____

7. Perform the matrix operations, if possible. $-8 \begin{bmatrix} 1 & 0 & 6 \\ 2 & 4 & -3 \end{bmatrix}$

[7] _____

8. Given $A = \begin{bmatrix} 0 & 2 & 1 \\ -5 & -1 & 0 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & -4 \\ 0 & 1 \\ 5 & -1 \end{bmatrix}$, find AB .

[8] _____

Perform the matrix operations, if possible.

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

[9] _____

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

[10] _____

Evaluate the determinant of the matrix.

11. $\begin{vmatrix} 4 & 1 \\ 4 & 7 \end{vmatrix}$

[11] _____

12. $\begin{vmatrix} 2 & 5 & 5 \\ 3 & 1 & 3 \\ 4 & 2 & 1 \end{vmatrix}$

[12] _____

13. Find the inverse of the matrix (if it exists) $\begin{bmatrix} 2 & -3 \\ 4 & -4 \end{bmatrix}$.

[13] _____

14. Find the inverse of the matrix (if it exists) $\begin{bmatrix} -2 & -4 \\ 4 & -1 \end{bmatrix}$.

[A] $\begin{bmatrix} -\frac{1}{18} & \frac{2}{9} \\ -\frac{2}{9} & -\frac{1}{9} \end{bmatrix}$

[B] $\begin{bmatrix} -1 & 4 \\ -4 & -2 \end{bmatrix}$

[C] A^{-1} does not exist.

[D] $\begin{bmatrix} -\frac{1}{9} & -\frac{2}{9} \\ \frac{2}{9} & -\frac{1}{18} \end{bmatrix}$

[14] _____

15. Solve the matrix equation.

$$\begin{bmatrix} -4 & 2 \\ 8 & 1 \end{bmatrix} X = \begin{bmatrix} -16 & 6 \\ 22 & 13 \end{bmatrix}$$

[15] _____

16. Solve the matrix equation.

$$\begin{bmatrix} 4 & 7 \\ 1 & 2 \end{bmatrix} X = \begin{bmatrix} 9 & 12 & 0 \\ -4 & 5 & -2 \end{bmatrix}$$

[16] _____

17. Solve the matrix equation.

$$\begin{bmatrix} 4 & 7 \\ 1 & 2 \end{bmatrix} X + \begin{bmatrix} 2 & 7 \\ -3 & 4 \end{bmatrix} = \begin{bmatrix} 6 & 2 \\ -2 & 3 \end{bmatrix}$$

[17] _____

18. Use an inverse matrix to solve the linear system.

$$\begin{cases} 5x + y = 19 \\ 9x + 2y = 35 \end{cases}$$

[18] _____

19. The inverse of the coefficient matrix is given. Use the inverse to solve the linear system.

$$\begin{cases} 3x + y + 4z = -15 \\ -2x - 3z = 14 \\ 4x + y + 6z = -23 \end{cases}, A^{-1} = \begin{bmatrix} 3 & -2 & -3 \\ 0 & 2 & 1 \\ -2 & 1 & 2 \end{bmatrix}$$

[19] _____

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Reference: [4.1.1.1]

[1] $\begin{bmatrix} -26 & -6 \\ 30 & 3 \end{bmatrix}$

Reference: [4.1.1.2]

[2] $\begin{bmatrix} 73 & -27 \\ -13 & -47 \end{bmatrix}$

Reference: [4.1.1.4]

[3] [B]

Reference: [4.1.1.5]

[4] [D]

Reference: [4.1.1.8]

[5] $\begin{bmatrix} 10 & 5 & -25 \\ 30 & -15 & 20 \end{bmatrix}$

Reference: [4.1.1.10]

[6] $x = 4, y = 2$

Reference: [4.1.1.17]

[7] $\begin{bmatrix} -8 & 0 & -48 \\ -16 & -32 & 24 \end{bmatrix}$

Reference: [4.2.1.22]

[8] $\begin{bmatrix} 5 & 1 \\ -5 & 19 \end{bmatrix}$

Reference: [4.2.1.24]

[9] $\begin{bmatrix} -5 & 14 \\ 27 & 14 \\ 14 & -4 \end{bmatrix}$

Reference: [4.2.1.25]

[10] Not possible

Reference: [4.3.1.32]

[11] 24

Reference: [4.3.1.34]

[12] 45

Reference: [4.4.1.61]

[13]
$$\begin{bmatrix} -1 & \frac{3}{4} \\ -1 & \frac{1}{2} \end{bmatrix}$$

Reference: [4.4.1.62]

[14] [A]

Reference: [4.4.1.68a]

[15]
$$\begin{bmatrix} 3 & 1 \\ -2 & 5 \end{bmatrix}$$

Reference: [4.4.1.68b]

[16]
$$\begin{bmatrix} 46 & -11 & 14 \\ -25 & 8 & -8 \end{bmatrix}$$

Reference: [4.4.1.68c]

[17]
$$\begin{bmatrix} 1 & -3 \\ 0 & 1 \end{bmatrix}$$

Reference: [4.5.1.72]

[18]
$$\begin{bmatrix} 5 & 1 \\ 9 & 2 \end{bmatrix}^{-1} \begin{bmatrix} 19 \\ 35 \end{bmatrix} = \begin{bmatrix} 3 \\ 4 \end{bmatrix}$$

Reference: [4.5.1.74]

[19] (-4, 5, -2)
