

For #1-3, state the dimensions of the matrix.

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

2.  $\begin{bmatrix} 9 \\ -8 \\ 2 \end{bmatrix}$

3.  $\begin{bmatrix} -2 & 3 & -1 \\ 0 & 0 & 2 \\ -1 & 8 & 2 \end{bmatrix}$

For #4-6, determine if each matrix product is possible. If so, state the dimensions of the product.

4.  $A_{1 \times 5} \cdot B_{5 \times 7}$

5.  $A_{2 \times 5} \cdot B_{2 \times 5}$

6.  $A_{3 \times 2} \cdot B_{2 \times 4}$

For #7-9, determine the dimensions of matrix M.

7.  $A_{1 \times 3} \cdot M = B_{1 \times 4}$

8.  $A_{2 \times 4} \cdot M = B_{2 \times 1}$

9.  $A_{3 \times 3} \cdot M = B_{3 \times 5}$

For #10 -, use matrices A-H.

$$A = \begin{bmatrix} 1 & 4 & -6 \\ 2 & -3 & -3 \end{bmatrix} \quad B = \begin{bmatrix} 3 & 0 & 6 \\ 4 & -3 & 8 \end{bmatrix} \quad C = \begin{bmatrix} 5 & 2 \\ 2 & -1 \\ 5 & 4 \end{bmatrix} \quad D = \begin{bmatrix} -2 & 2 \\ 0 & -1 \\ -5 & 7 \end{bmatrix} \quad E = \begin{bmatrix} 2 & 4 \\ -3 & 1 \end{bmatrix}$$
$$F = \begin{bmatrix} -2 & 3 & -1 \\ 0 & 0 & 2 \\ -1 & 8 & 2 \end{bmatrix} \quad G = \begin{bmatrix} 5 & 3 & 0 \\ 0 & 4 & -1 \\ 3 & -5 & 0 \end{bmatrix} \quad H = \begin{bmatrix} 9 \\ -8 \\ 2 \end{bmatrix}$$

10.  $2A - \frac{1}{3}B$

11.  $C - D$

12.  $D \cdot A$

13.  $E^{-1}$  (By hand)

14.  $F^{-1}$  (By calculator)

15.  $-2F + G$

16.  $C \cdot D$

17.  $G \cdot H$

18.  $B \cdot D$

19. Determinant of F

20. Determinant of E

21. Find AB

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

22. Find the determinant by hand of  $A = \begin{bmatrix} 5 & -3 & 2 \\ 6 & 10 & -1 \\ 1 & -2 & 0 \end{bmatrix}$ .

For #23 – 26, solve the systems using matrices. Show the matrix equation you used.

$$23. \begin{cases} -3x - 4y = 9 \\ 9x + 10y = -3 \end{cases}$$

$$24. \begin{cases} x + 2y = 2 \\ 3x + 6y = 6 \end{cases}$$

$$25. \begin{cases} 2x - y + 2z = 12 \\ x + 2y - 2z = -11 \\ 2x + y + 3z = 12 \end{cases}$$

$$26. \begin{cases} -2x - 4z = 2 \\ -3y + 5z = -14 \\ x + 2y = 7 \end{cases}$$

27. Give an example of 2 matrices that can be multiplied. Why?

28. Give an example of 2 Matrices that CAN NOT be multiplied. Why?