

Determinants of 3×3 Matrices

Evaluate the determinant of each matrix.

1)
$$\begin{bmatrix} 3 & -2 & 1 \\ 3 & -1 & -2 \\ 3 & -2 & -3 \end{bmatrix}$$

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

Evaluate each determinant.

3)
$$\begin{vmatrix} 5 & 3 & 3 \\ -4 & -5 & 1 \\ 5 & 3 & 0 \end{vmatrix}$$

4)
$$\begin{vmatrix} -6 & -6 & 1 \\ 3 & -5 & -2 \\ 4 & 3 & -3 \end{vmatrix}$$

5)
$$\begin{vmatrix} 6 & 2 & -1 \\ -5 & -4 & -5 \\ 3 & -3 & 1 \end{vmatrix}$$

6)
$$\begin{vmatrix} -2 & 5 & -4 \\ 0 & -3 & 5 \\ -5 & 5 & -6 \end{vmatrix}$$

7)
$$\begin{vmatrix} 3 & 4 & 5 \\ -4 & 6 & 3 \\ 1 & -4 & 3 \end{vmatrix}$$

8)
$$\begin{vmatrix} 6 & 5 & -3 \\ -5 & 4 & -2 \\ 1 & -4 & 5 \end{vmatrix}$$

9)
$$\begin{vmatrix} -1 & -8 & 9 \\ 4 & 12 & -7 \\ -10 & 3 & 2 \end{vmatrix}$$

10)
$$\begin{vmatrix} -5 & 5 & 5 \\ -8 & 9 & -3 \\ 8 & 5 & 9 \end{vmatrix}$$

11)
$$\begin{vmatrix} 0 & a & b \\ 0 & c & d \\ 0 & x & y \end{vmatrix}$$

12) What value of x makes the determinant -4 ?
$$\begin{vmatrix} -2 & 0 & 0 \\ -6 & x & 1 \\ -4 & 0 & -1 \end{vmatrix}$$

Determinants of 3×3 Matrices

Evaluate the determinant of each matrix.

1)
$$\begin{bmatrix} 3 & -2 & 1 \\ 3 & -1 & -2 \\ 3 & -2 & -3 \end{bmatrix}$$

-12

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

-24

Evaluate each determinant.

3)
$$\begin{vmatrix} 5 & 3 & 3 \\ -4 & -5 & 1 \\ 5 & 3 & 0 \end{vmatrix}$$

39

4)
$$\begin{vmatrix} -6 & -6 & 1 \\ 3 & -5 & -2 \\ 4 & 3 & -3 \end{vmatrix}$$

-103

5)
$$\begin{vmatrix} 6 & 2 & -1 \\ -5 & -4 & -5 \\ 3 & -3 & 1 \end{vmatrix}$$

-161

6)
$$\begin{vmatrix} -2 & 5 & -4 \\ 0 & -3 & 5 \\ -5 & 5 & -6 \end{vmatrix}$$

-51

7)
$$\begin{vmatrix} 3 & 4 & 5 \\ -4 & 6 & 3 \\ 1 & -4 & 3 \end{vmatrix}$$

200

8)
$$\begin{vmatrix} 6 & 5 & -3 \\ -5 & 4 & -2 \\ 1 & -4 & 5 \end{vmatrix}$$

139

9)
$$\begin{vmatrix} -1 & -8 & 9 \\ 4 & 12 & -7 \\ -10 & 3 & 2 \end{vmatrix}$$

647

10)
$$\begin{vmatrix} -5 & 5 & 5 \\ -8 & 9 & -3 \\ 8 & 5 & 9 \end{vmatrix}$$

-800

11)
$$\begin{vmatrix} 0 & a & b \\ 0 & c & d \\ 0 & x & y \end{vmatrix}$$

012) What value of x makes the determinant -4 ?

$$\begin{vmatrix} -2 & 0 & 0 \\ -6 & x & 1 \\ -4 & 0 & -1 \end{vmatrix}$$

-2