Q1 For a 2 × 2 matrix $A = \begin{bmatrix} a & b \\ c & d \end{bmatrix}$, the determinant $|A|$ is calculated as

(A) ad + bc   (B) ac – bd

(C) ad – bc   (D) bc – ad

Q2 The value of the determinant of the matrix $A = \begin{bmatrix} 2 & -1 \\ 3 & -5 \end{bmatrix}$ is equal to

(A) 7   (B) –7

(C) –8   (D) 8

Q3 The value of the determinant of the matrix A = [–5] is equal to

(A) –5   (B) 5

(C) 10   (D) –10

Q4 The value of $\begin{vmatrix} \sin\theta & -\cos\theta \\ \cos\theta & \sin\theta \end{vmatrix}$ is equal to

(A) 0   (B) –1

(C) 1   (D) 2

Q5 If $\begin{vmatrix} k & -2 \\ 5 & 7 \end{vmatrix} = \begin{vmatrix} 1 & -1 \\ 2 & 3 \end{vmatrix}$, then k is

(A) $\frac{5}{7}$ (B) $\frac{-5}{7}$

(C) $\frac{-3}{2}$ (D) $\frac{3}{2}$

Q6 The value of the determinant $\begin{vmatrix} 6 & 7 & 8 \\ 18 & 21 & 24 \\ 5 & -6 & 2 \end{vmatrix}$ is

(A) 0   (B) 4

(C) –4   (D) 1

Q7 The value of the determinant $\begin{vmatrix} 14 & 8 & 11 \\ 6 & 5 & 6 \\ 8 & 3 & 5 \end{vmatrix}$ is

(A) 0   (B) 5

(C) 15   (D) 75

Q8 If $\begin{vmatrix} \alpha & 3 & 4 \\ 1 & 2 & 1 \\ 1 & 4 & 1 \end{vmatrix} = 0$, then the value of α is

(A) 1   (B) 2

(C) 3   (D) 4

Q9 If $A = \begin{bmatrix} 2 & -5 \\ 3 & 7 \end{bmatrix}$, then the value of $|2A|$ is equal to

(A) 117   (B) 116

(C) 115   (D) 118

Q10 If $|A| = 20$, then the value of $|3A|$ is equal to (order of matrix A is 3)

(A) 680   (B) 580

(C) 640   (D) 540

Answer Key

Q1	C		Q6	A
Q2	B		Q7	A
Q3	A		Q8	D
Q4	C		Q9	B
Q5	B		Q10	D

Hints & Solutions

Note: scan the QR code to watch video solution

Q1 **Text Solution:**

This is the standard formula for a 2×2 determinant.

i.e. |A| = ad – bc

Video Solution:

Q2 **Text Solution:**

$$|A| = \begin{vmatrix} 2 & -1 \\ 3 & -5 \end{vmatrix}$$

$= 2 \times (-5) - (-1) \times (3)$

$= -10 + 3$

$= -7$

Video Solution:

Q3 **Text Solution:**

Determinant of a matrix whose order is 1 × 1 is the element of matrix itself.

i e. If A = [a] then |A| = a

∴ Determinant of the given matrix A = –5

Video Solution:

Q4 **Text Solution:**

$$\begin{vmatrix} \sin\theta & -\cos\theta \\ \cos\theta & \sin\theta \end{vmatrix} = \sin^2\theta - \left(-\cos^2\theta\right)$$

$$= \sin^2\theta + \cos^2\theta$$

$= 1$

Video Solution:

Q5 **Text Solution:**

$$\begin{vmatrix} k & -2 \\ 5 & 7 \end{vmatrix} = \begin{vmatrix} 1 & -1 \\ 2 & 3 \end{vmatrix}$$

$\Rightarrow$ 7k – (5) (–2) = 1 × 3 – (2) (–1)

$\Rightarrow$ 7k + 10 = 3 + 2

$\Rightarrow$ 7k = –5

$$\Rightarrow k = \frac{-5}{7}$$

Video Solution:

Q6 **Text Solution:**

$$\begin{vmatrix} 6 & 7 & 8 \\ 18 & 21 & 24 \\ 5 & -6 & 2 \end{vmatrix} = 6\begin{vmatrix} 21 & 24 \\ -6 & 2 \end{vmatrix} - 7\begin{vmatrix} 18 & 24 \\ 5 & 2 \end{vmatrix}$$

$$+ 8\begin{vmatrix} 18 & 21 \\ 5 & -6 \end{vmatrix}$$

$$= 6[42 + 144] - 7(36 - 120)$$

$$+ 8(-108 - 105)$$

$$= 1116 - 7(-84) + 8 \times (-213)$$

$$= 1116 + 588 - 1704$$

$$= 1704 - 1704 = 0$$

Video Solution:

Q7 Text Solution:

$$\begin{vmatrix} 14 & 8 & 11 \\ 6 & 5 & 6 \\ 8 & 3 & 5 \end{vmatrix} = 14\begin{vmatrix} 5 & 6 \\ 3 & 5 \end{vmatrix} - 8\begin{vmatrix} 6 & 6 \\ 8 & 5 \end{vmatrix}$$

$$+11\begin{vmatrix} 6 & 5 \\ 8 & 3 \end{vmatrix}$$

$$= 14(25 - 18) - 8(30 - 48)$$
$$+ 11(18 - 40)$$
$$= 14 \times 7 - 8 \times (-18) + 11(-22)$$
$$= 98 + 144 - 242$$
$$= 242 - 242 = 0$$

Video Solution:

Q8 Text Solution:

$$\begin{vmatrix} \alpha & 3 & 4 \\ 1 & 2 & 1 \\ 1 & 4 & 1 \end{vmatrix} = 0$$

$$\Rightarrow \alpha(2 - 4) - 3(1 - 1) + 4(4 - 2) = 0$$
$$\Rightarrow -2\alpha + 8 = 0$$
$$\Rightarrow \alpha = 4$$

Video Solution:

Q9 Text Solution:

$$|A| = \begin{vmatrix} 2 & -5 \\ 3 & 7 \end{vmatrix} = 14 - \left(-15\right) = 14$$

$$+ 15 = 29$$

As $|kA| = k^n|A|$ where n is order of A

$$\therefore |2A| = 2^2|A| = 4 \times 29 = 116$$

Video Solution:

Q10 Text Solution:

As $|kA| = k^n|A|$ where n is order of A

$$\therefore |3A| = 3^3|A| = 27 \times 20 = 540$$

Video Solution: