RAVI MATHS TUITION CENTER, CHENNAI-82. WHATSAPP - 8056206308

Determinants

12th Standard

Maths

50 x 1 = 50

1) $\begin{vmatrix} x & 2 \\ 18 & x \end{vmatrix} = \begin{vmatrix} 6 & 2 \\ 18 & 6 \end{vmatrix}$, then x is equal to

(a) 6 (b) ± 6 (c) -6 (d) 0

2) Let A be a square matrix of order 3 × 3, then |kA| is equal to

(a) k|A| (b) k^2 |A| (c) k^3 |A| (d) 3k |A|

3) Which of the following is correct

(a) Determinant is a square matrix (b) Determinant is a number associated to a matrix

(c) Determinant is a number associated to a square matrix (d) None of these

4) If area of triangle is 35 sq units with vertices (2, – 6), (5, 4) and (k, 4). Then k is

(a) 12 (b) –2 (c) –12, –2 (d) 12, –2

5) If $\Delta = \begin{vmatrix} a_{11} & a_{12} & a_{13} \\ a_{21} & a_{22} & a_{23} \\ a_{31} & a_{32} & a_{33} \end{vmatrix}$ and A_{ij} is Cofactors of aij, then value of Δ is given by

(a) $a_{11} A_{31} + a_{12} A_{32} + a_{13} A_{33}$ (b) $a_{11} A_{11} + a_{12} A_{21} + a_{13} A_{31}$ (c) $a_{21} A_{11} + a_{22} A_{12} + a_{23} A_{13}$

(d) $a_{11} A_{11} + a_{21} A_{21} + a_{31} A_{31}$

6) Let A be a nonsingular square matrix of order 3 × 3. Then |adj A| is equal to

(a) |A| (b) $|A|^2$ (c) $|A|^3$ (d) 3|A|

7) If A is an invertible matrix of order 2, then det (A^{-1}) is equal to

(a) det (A) (b) $\frac{1}{det(A)}$ (c) 1 (d) 0

8) If a, b, c, are in A.P, then the determinant $\begin{vmatrix} x+2 & x+3 & x+2b \\ x+3 & x+4 & x+2b \\ x+4 & x+5 & x+2c \end{vmatrix}$ is

(a) 0 (b) 1 (c) x (d) 2x

9) If x, y, z are nonzero real numbers, then the inverse of matrix A = $\begin{bmatrix} x & 0 & 0 \\ 0 & y & 0 \\ 0 & 0 & z \end{bmatrix}$ is

(a) $\begin{bmatrix} x^{-1} & 0 & 0 \\ 0 & y^{-1} & 0 \\ 0 & 0 & z^{-1} \end{bmatrix}$ (b) $xyz \begin{bmatrix} x^{-1} & 0 & 0 \\ 0 & y^{-1} & 0 \\ 0 & 0 & z^{-1} \end{bmatrix}$ (c) $\frac{1}{xyz} \begin{bmatrix} x & 0 & 0 \\ 0 & y & 0 \\ 0 & 0 & z \end{bmatrix}$ (d) $\frac{1}{xyz} \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$

10) Let A = $\begin{bmatrix} 1 & sin\theta & 1 \\ -sin\theta & 1 & sin\theta \\ -1 & -sin\theta & 1 \end{bmatrix}$, where 0 ≤ θ ≤2π.Then

(a) Det (A) = 0 (b) Det (A) ∈ (2, ∞) (c) Det (A) ∈ (2, 4) (d) Det (A) ∈ [2, 4]

11) If $\begin{vmatrix} 2x & -1 \\ 4 & 2 \end{vmatrix} = \begin{vmatrix} 3 & 0 \\ 2 & 1 \end{vmatrix}$ then x is

(a) 3 (b) $\frac{2}{3}$ (c) $\frac{3}{2}$ (d) $-\frac{1}{4}$

12) The value $\begin{vmatrix} 6 & 0 & -1 \\ 2 & 1 & 4 \\ 1 & 1 & 3 \end{vmatrix}$ is

(a) -7 (b) 7 (c) 8 (d) 10

13) Let A be a square matrix of order 2 × 2, then |KA| is equal to

(a) K|A| (b) $K^2|A|$ (c) $K^3|A|$ (d) 2K|A|

14) If $\begin{bmatrix} a_{11} & a_{12} & a_{13} \\ a_{21} & a_{22} & a_{23} \\ a_{31} & a_{32} & a_{33} \end{bmatrix}$ and Aij is cofactor of aij, then the value of Δ is given by

(a) $a_{11}A_{31} + a_{12}A_{32} + a_{13}A_{33}$ (b) $a_{11}A_{11} + a_{12}A_{21} + a_{13}A_{31}$ (c) $a_{21}A_{11} + a_{22}A_{12} + a_{23}A_{13}$

(d) $a_{11}A_{11} + a_{21}A_{21} + a_{31}A_{31}$

15) A and B are invertible matrices of the same order such that $|(AB)^{-1}| = 8$, If |A| = 2, then |B| is

(a) 16 (b) 4 (c) 6 (d) $\frac{1}{16}$

16) If $\begin{vmatrix} x & 2 \\ 18 & x \end{vmatrix} = \begin{vmatrix} 6 & 2 \\ 18 & 6 \end{vmatrix}$ then, x is equal to

(a) 6 (b) ±6 (c) -6 (d) zero

17) Let A be a square matrix of order 3 x 3, then IkA I is equal to

(a) k|A| (b) $k^2|A|$ (c) $K^3|A|$ (d) 3k|A|

18) Let $\Delta = \begin{vmatrix} Ax & x^2 & 1 \\ By & y^2 & 1 \\ Cz & z^2 & 1 \end{vmatrix}$ and $\Delta_1 = \begin{vmatrix} A & B & C \\ x & y & z \\ zy & zx & xy \end{vmatrix}$ then

(a) $\Delta_1 = -\Delta$ (b) $\Delta \neq \Delta_1$ (c) $\Delta^2 - \Delta_1 = 0$ (d) None of these

19) Iff $f(x) = \begin{vmatrix} 0 & x-a & x-b \\ x+a & 0 & x-c \\ x+b & x+c & 0 \end{vmatrix}$ then

(a) f(a) = 0 (b) f(b) = 0 (c) f(0) = 0 (d) f(1) = 0

20) The determinant $\begin{vmatrix} x & \sin\theta & \cos\theta \\ -\sin\theta & -x & 1 \\ \cos\theta & 1 & x \end{vmatrix}$ is

(a) independent of θ only (b) independent of x only (c) independent of both ɵ and x

(d) None of the above

21) The area of triangle with vertices $(x_1\ y_l)$, $(x_2'y_2)$ and $(x_3'y_3)$ is

(a) $\Delta = \frac{1}{2}\begin{vmatrix} x_1 & y_1 & 1 \\ x_2 & y_2 & 1 \\ x_3 & y_3 & 1 \end{vmatrix}$ (b) $\Delta = \frac{1}{2}\begin{vmatrix} x_1 & y_1 & 1 \\ y_1 & y_2 & 1 \\ x_3 & y_3 & 1 \end{vmatrix}$ (c) $\Delta = \begin{vmatrix} x_1 & y_1 & 1 \\ x_2 & y_2 & 1 \\ x_3 & y_3 & 1 \end{vmatrix}$ (d) None of these

22) Area of the triangle whose vertices are (a, b + c), (b, c + a) and (c, a + b), is

(a) 2 sq units (b) 3 sq unit (c) 0 sq unit (d) None of the above

23) If area of a triangle is 35 sq. units with vertices (2, - 6), (5, 4) and (k, 4),then k is

(a) 12 (b) -2 (c) -12, -2 (d) 12, -2

24) The area of the triangle formed by 3 collinear points is

(a) one (b) two (c) zero (d) four

25) Minor of an element of a determinant of order $n(n \geq 2)$ is a determinant of order.

(a) n (b) n-1 (c) n-2 (d) n+1

26) If $\Delta = \begin{vmatrix} 1 & a & bc \\ 1 & b & ca \\ 1 & c & ab \end{vmatrix}$ then the minor M_{31} is

(a) $-c(a^2 - b^2)$ (b) $c(b^2-a^2)$ (c) $c(a^2 + b^2)$ (d) $c(a^2-b^2)$

27) If $\Delta = \begin{vmatrix} a & h & g \\ h & b & f \\ g & f & c \end{vmatrix}$ then the cofactor A_{21} is

(a) -(he + fg) (b) fg -hc (c) fg + hc (d) hc-fg

28) If M_u = - 40, M_{12} = - 10 and M_{13} = 35 of the determinant $\Delta = \begin{vmatrix} 1 & 3 & -2 \\ 4 & -5 & 6 \\ 3 & 5 & 2 \end{vmatrix}$ then the value of Δ is

(a) -80 (b) 60 (c) 70 (d) 100

29) If $\Delta = \begin{vmatrix} a_{11} & a_{12} & a_{13} \\ a_{21} & a_{22} & a_{23} \\ a_{31} & a_{32} & a_{33} \end{vmatrix}$ and A_{ij} is cofactor of a_{ij}, then value of Δ is given by

(a) $a_{11}A_{31}+a_{12}+A_{32}+a_{13}A_{33}$ (b) $a_{11}A_{11} + a_{12}A_{21}+ a_{13}A_{31}$ (c) $a_{21}A_{11} + a_{22}A_{12} + a_2A_{13}$

(d) $a_{11}A_{11} + a_{21}A_{21}+ a_{31}A_{31}$

30) Let A be the non-singular square matrix of order 3 x 3, then [adj A Iis equal to

(a) |A| (b) IAI^2 (c) IA|^3 (d) 3|A|

31) If $A = \begin{bmatrix} 2 & 3 \\ -4 & -6 \end{bmatrix}$ then which of the following is true?

(a) $A(\text{adj } A) \neq |A|I$ (b) $A(\text{adj } A) \neq (\text{adj } A)A$ (c) $A(\text{adj } A) = (\text{adj } A)A = |A|I = \begin{bmatrix} 0 & 0 \\ 0 & 0 \end{bmatrix}$

(d) None of the above

32) If $A = \begin{vmatrix} 2 & \lambda & -3 \\ 0 & 2 & 5 \\ 1 & 1 & 3 \end{vmatrix}$ then A^{-1} exists, if

(a) $\lambda = 2$ (b) $\lambda \neq 2$ (c) $\lambda \neq -2$ (d) None of these

33) If A is an invertible matrix of order 2, then det (A^{-1}) is equal to

(a) det (A) (b) $\frac{1}{\det(A)}$ (c) 1 (d) zero

34) If A and B are invertible matrices, then which of the following is not correct?

(a) $\text{adj } A = |A| \cdot A^{-1}$ (b) $\det(A)^{-1} = [\det(A)]^{-1}$ (c) $(AB)^{-1} = B^{-1}A^{-1}$ (d) $(A + B)^{-1} = B^{-1} + A^{-1}$

35) If A is singular matrix and $(\text{adj } A)B \neq O$ then

(a) there is unique solution (b) solution does not exist (c) there are infinitely many solutions

(d) None of the above

36) For the system of equations 5x + 2y = 4; 7x +3y = 5 the values of x and yare respectively.

(a) x = 2, y = -3 (b) x = 2, y = 3 (c) x = -2, y = -3 (d) x = -2, y = 3

37) The simultaneous equations kx + 2y -z = 1, (k -1)y - 2z = 2, (k + 2)z = 3 have only one solution when

(a) k = -2 (b) k = -1 (c) k = 0 (d) k = 1

38) Given,2x - y + 2z = 2, x - 2y + Z = - 4 and x + y + λz= 4, then the value of Asuch that the given system of equation has no solution is

(a) 3 (b) 1 (c) 0 (d) -3

39) For what value of k, the following system of linear equations will have infinite solutions?

$x - y + z = 3$
$2x + y - z = 2$
$-3x - 2ky + 6z = 3$

(a) $k \neq 2$ (b) k = 0 (c) k = 3 (d) k = -1

40) if a, b, c are in AP, then determinant

$$\begin{vmatrix} x+2 & x+3 & x+2a \\ x+3 & x+4 & x+2b \\ x+4 & x+5 & x+2c \end{vmatrix}$$ is

(a) zero (b) 1 (c) x (d) 2x

41) If $f(t) = \begin{bmatrix} \cos t & t & 1 \\ 2\sin t & t & 2t \\ \sin t & t & t \end{bmatrix}$, then $\lim_{t\to 0} \frac{f(t)}{t^2}$ is equal to

(a) 0 (b) -1 (c) 2 (d) 3

42) If $f(t) = \begin{bmatrix} \cos t & t & 1 \\ 2\sin t & t & 2t \\ \sin t & t & t \end{bmatrix}$, then $\lim_{t\to 0} \frac{f(t)}{t^2}$ is equal to

(a) 0 (b) -1 (c) 2 (d) 3

43) Asquare matrix A is said to be non-singular, if

(a) $|A| = 0$ (b) $|A| \neq 0$ (c) $|A| = -1$ (d) $|A| = 1$

44) If A and B are square matrices of same order,then

(a) $|AB| = |A| \cdot |B|$ (b) $|AB| \neq |A| \cdot |B|$ (c) $|AB| = \frac{|A|}{|B|}, |B| \neq 0$ (d) $|AB| = \frac{|B|}{|A|}, |A| \neq 0$

45) The adjoint of the matrix $A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$ is

(a) $\begin{bmatrix} 4 & 2 \\ 3 & 1 \end{bmatrix}$ (b) $\begin{bmatrix} -4 & 2 \\ 3 & -1 \end{bmatrix}$ (c) $\begin{bmatrix} 4 & -2 \\ -3 & 1 \end{bmatrix}$ (d) $\begin{bmatrix} 1 & -2 \\ -3 & 4 \end{bmatrix}$

46) If A and B are invertible matrices then which of the following is not correct

(a) $AdjA = |A| \cdot A^{-1}$ (b) $\det(A^{-1}) = (\det A)^{-1}$ (c) $(AB)^{-1} = B^{-1}A^{-1}$ (d) $(A+B)^{-1} = A^{-1} + B^{-1}$

47) Let A be a non-angular square matrix of order 3 x 3, then |A . adj A| is equal to

(a) $|A|^3$ (b) $|A|^2$ (c) |A| (d) 3|A|

48) Let A be a square matrix of order 3 x 3 and k a scalar, then |kA| is equal to

(a) k|A| (b) |k||A| (c) $k^3|A|$ (d) none of these

49) If a, b. c are all distinct, and $\begin{vmatrix} a & a^2 & 1+a^3 \\ b & b^2 & 1+b^3 \\ c & c^2 & a+c^3 \end{vmatrix} = 0$ then the value of abc is

(a) 0 (b) -1 (c) 3 (d) -3

50) If a, b, c are in AP, then the value of

$$\begin{vmatrix} x+1 & x+2 & x+a \\ x+2 & x+3 & x+b \\ x+3 & x+4 & x+c \end{vmatrix}$$ is

(a) 4 (b) -3 (c) 0 (d) abc

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