MATHS

NCERT - NCERT MATHEMATICS(GUJRATI)

DETERMINANTS

Example

1. If $A = \begin{bmatrix} -2 & 4 \\ -1 & 2 \end{bmatrix}$ then A^2 is equal to

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2. Evaluate $\begin{bmatrix} x & x+1 \\ x-1 & x \end{bmatrix}$

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3. Evaluate the determinant $\Delta = \begin{vmatrix} 1 & 2 & 4 \\ -1 & 3 & 0 \\ 4 & 1 & 0 \end{vmatrix}$

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4. Evaluate $\Delta = |0 \sin \alpha - \cos \alpha - \sin \alpha 0 \sin \beta \cos \alpha - \sin \beta 0|$

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5. Find values of x for which $|3 \times 1| = |3241|$

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6. Verify Property 1 for $\Delta = |2 - 3560415 - 7|$

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7. Verify Property 2 for $\Delta = |2 - 3560415 - 7|$

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8. Evaluate $\Delta = \begin{vmatrix} 3 & 2 & 3 \\ 2 & 2 & 3 \\ 3 & 2 & 3 \end{vmatrix}$

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9. Evaluate $\begin{bmatrix} 102 & 18 & 36 \\ 1 & 3 & 4 \\ 17 & 3 & 6 \end{bmatrix}$

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10. Show that $|abca + 2xb + 2yc + 2zxyz| = 0$

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11. Using properties of determinants, prove that

$$|aa+ba+b+c2a3a+2b4a+3b+2c3a6a+3b10a+6b+3c| = a^3$$

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12. Without expanding, prove that $\Delta = |x+yy+zz+xzxy111| = 0$

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13. $\begin{vmatrix} 1 & a & bc \\ 1 & b & ca \\ 1 & c & ab \end{vmatrix} =$

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14. Prove that $\begin{bmatrix} b+c & a & a \\ b & c+a & b \\ c & c & b+a \end{bmatrix}$

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15. If x, y, z are different and $\Delta = \left| \times^2 \ 1 + x^3 yy^2 1 + y^3 zz^2 1 + z^3 \right| = 0,$ then

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16. Show that

$$|1 + a1111 + b1111 + c| = abc\left(1 + \frac{1}{a} + \frac{1}{b} + \frac{1}{c}\right) = abc + bc + ca + ab$$

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17. Find the area of the triangle whose vertices are (3,8), (-4,2) and (5, -1).

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18. Find the equation of the line joining A(1,3) and B (0,0) using determinants and find k if D(k, 0) is a point such that area of triangle ABD is 3sq units.

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19. The cofactor of the element 4 in the determinant $\begin{vmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{vmatrix}$.

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20. Find minors and cofactors of all the elements of the determinant

$|1 - 243|$

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21. Find the mirrors and cofactors of the elements of the determinant

$$\Delta = \begin{vmatrix} a_{11} & a_{12} & a_{13} \\ a_{21} & a_{22} & a_{23} \\ a_{31} & a_{32} & a_{33} \end{vmatrix}$$

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22. Find minors and cofactors of the elements of the determinant $|2 - 3560415 - 7|$ and verify that $a_{11}A_{31} + a_{12}A_{32} + a_{13}A_{33} = 0$

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23. Find adj A for A = $\begin{bmatrix} 2 & 3 \\ 1 & 4 \end{bmatrix}$

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24. If $A = [133143134]$,then verify that $A \quad adj \quad A \quad = \quad |A \mid I$. Also find A^{-1} .

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25. If $A = [231 - 4]$ and $B = [1 - 2 - 13]$, then verify that $(AB)^{-1} = B^{-1}A^{-1}$

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26. Show that thematrix A= $\begin{bmatrix} 2 & 3 \\ 1 & 2 \end{bmatrix}$ satisfies the equations $A^2 - 4A + I = 0$ where I is 2×2 identity matrix and O is 2×2 zero matrix. Using the equations. Find A^{-1}.

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27. Solve the system of equations $2x + 5y = 1$ $3x + 2y = 7$

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28. Solve the following system of equations by matrix method. $3x2y + 3z = 82x + y - z = 14x - 3; y + 2z = 4$

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29. The sum of three numbers is 6. If we multiply third number by 3 and add second number to it, we get 11. By adding first and third numbers, we get double of the second number. Represent it algebraically and find the numbers using matrix method.

A. $x = 1, y = 2, z = 3$

B.

C.

D.

Answer:

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30. If a, b, c are positive and unequal, show that value of the determinant

$\Delta = \begin{vmatrix} a & b & c \\ b & c & a \\ c & a & b \end{vmatrix}$ is negative

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31. If a, b, c, are in A.P, find value of

$|ay+45y+78y+a3y+56y+89y+b4y+67y+910y+c|$

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32. Show that

$\Delta = \left|(y+z)^2 xyz \times y(x+z)^2 yzxzyz(x+y)^2\right| = 2xyz(x+y+z)^3.$

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33. Use product $[1-1202-33-24]\ [-20192-361-2]$ to solve the system of equation: $x-y+2z=1\ 2y-3z=1\ 3x-2y+4z=2$

A. $z=3$

B.

C.

D.

Answer:

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34. Prove that

$\Delta = [a + bxc + dxp + qxax + bcx + dpx + quvw] = (1 - x^2)|acpbdqucw$

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Exercise 4 1

1. Evaluate the determinants in $|24 - 5 - 1|$

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2. $(i)\begin{bmatrix} \cos\theta & -\sin\theta \\ \sin\theta & \cos\theta \end{bmatrix}$ $(ii)\begin{bmatrix} x^2 - x + 1 & x - 1 \\ x + 1 & x + 1 \end{bmatrix}$

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3. Evalute the determinants in queations 1 and 2 :

If $A = \begin{bmatrix} 1 & 2 \\ 4 & 2 \end{bmatrix}$, then show that |2A|=4|A|.

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4. If $A = [101012004]$, then show that $|3A| \quad = \quad 27|A|$

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5. Evalute the determinants :

(i) $\begin{vmatrix} 3 & -1 & -2 \\ 0 & 0 & 1 \\ 3 & -5 & 0 \end{vmatrix}$

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

(iii) $\begin{vmatrix} 0 & 1 & 2 \\ -1 & 0 & -3 \\ -2 & 3 & 0 \end{vmatrix}$

(iv) $\begin{vmatrix} 2 & -1 & -2 \\ 0 & 2 & -1 \\ 3 & -5 & 0 \end{vmatrix}$

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6. Evalute the determinants in queations 1 and 2 :

If $A = \begin{vmatrix} 1 & 1 & -2 \\ 2 & 1 & -3 \\ 5 & 4 & -9 \end{vmatrix}$, find |A|.

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7. Evalute the determinants in queations 1 and 2 :

Find the values of x, if

(i) $\begin{vmatrix} 2 & 4 \\ 5 & 1 \end{vmatrix} = \begin{vmatrix} 2x & 4 \\ 6 & x \end{vmatrix}$

(ii) $\begin{vmatrix} 2 & 3 \\ 4 & 5 \end{vmatrix} = \begin{vmatrix} x & 3 \\ 2x & 5 \end{vmatrix}$

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8. Evalute the determinants in queations 1 and 2 :

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

0

A. 6

B. ± 6

C. -6

D. 0

Answer: B

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Exercise 4 2

1. Using the property of determinants and without expanding, prove that:

$|xax + ayby + bzcz + c| = 0$

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2. Using the property of determinants and without expanding, prove that:

$|a - \; - \; - ab - \; - aa - bc - aa - \; - c| = 0$

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3. Using the property of determinants and without expanding, prove that

$$\begin{vmatrix} 2 & 7 & 65 \\ 3 & 8 & 75 \\ 5 & 9 & 86 \end{vmatrix} = 0$$

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4. Using the property of determinants and without expanding, prove that:

$|1bca(b + c)1cab(c + a)1abx(a + b)| = 0$

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5. Use the properties of determinant and without expanding prove that

$$\begin{vmatrix} b+c & q+r & y+z \\ c+a & r+p & z+x \\ a+b & p+q & x+y \end{vmatrix}.$$

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6. Using the property of determinants and without expanding, prove that:

$$|0a - b - a0 - cbc0| = 0$$

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7. Using the property of determinants and without expanding, prove that:

$$\left| - a^2 abacbab^2 bacb - c^2 \right| = 4a^2b^2c^2$$

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8. By using properties of determinants. Show that:(i)

$\left|1aa^21\hat{\ }21\hat{\ }2\right| = (a-b)(b-c)(c-a)$(ii)

$\left|111abca^3b^3c^3\right| = (a-b)(b-c)(c-a)(a+b+c)$

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9. By using properties of determinants. Show that:

$\left|\times^2 yzyy^2zxzz^2xy\right| = (x-y)(y-z)(z-x)(xy+yz+zx)$

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10. By using properties of determinants. Show that: (i)

$|x+42x2x2\times\ +42x2x2\times\ +4| = (5x-4)(4-x)^2$ (ii)

$|y+kyyyy+kyyyy+k| = k^2\left(2y\dot{k}\right)^2$

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11. By using properties of determinants. Show that:(i)

$|a-b-c2a2a2-c-a2b2c2-a-b| = (a+b+c)^3$ (ii)

$|x+y+2zxyzy+z+2xyzxz+x+2y| = 2(x+y+z)^3$

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12. By using properties of determinants. Show that:

$\left|1 \times^2 x^2 1 \times x^2 1\right| = \left(1-x^3\right)^2$

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13. Show that

$$\begin{vmatrix} 1+a^2-b^2 & 2ab & -2b \\ 2ab & 1-a^2+b^2 & 2a \\ 2b & -2a & 1-a^2-b^2 \end{vmatrix} = \left(1+a^2+b^2\right)^3$$

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14. One factor of $\begin{vmatrix} a^2+x & ab & ac \\ ab & b^2+x & cb \\ ca & cb & c^2+x \end{vmatrix}$, is

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15. 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) $3k|A|$

A. $k|A|$

B. $k^2|A|$

C. $k^3|A|$

D. $3k|A|$

Answer: C

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16. 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

Answer: C

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Exercise 4 3

1. Find area of the triangle with vertices at the point given in each of the following :

(i) (1,0), (6,0), (4,3)

(ii) (2,7), (1,1), (10,8)

(iii) (-2,-3), (3,2), (-1,-8)

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2. Find area the triangle with at the point given in each of the following

(2,7),(1,1) (10,8)

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3. Find area of the triangle with vertices at the point given in each of the following:

$(-2, -3), (3, 2), (-1, -8)$

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4. Show that points $A(a, b+c), B(b, c+a), C(c, a+b)$ are collinear.

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5. Find the values of k if area of tringle is 4 sq. units and dvertices are :

(i) (k,0), (4,0), (0,2)

(ii) (-2,0), (0,4), (0,k)

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6. (i) Find equation of line joining (1,2) and (3,6) using determinants, (ii) Find equation of line joining (3, 1) and (9,3) using determinants.

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7. 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) $12, 2$

A. 12

B. -2

C. $-12, -2$

D. $12, -2$

Answer: D

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Exercise 4 4

1. Write Minors and Cofactors of the elements of following determinants:

(i) $|2 - 403|$ (ii) $|acbd|$

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2. $\begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$ $(ii)\begin{bmatrix} 1 & 0 & 4 \\ 3 & 5 & -1 \\ 0 & 1 & 2 \end{bmatrix}$

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3. Using Cofactors of elements of second row, evaluate $\Delta = |538201123|$

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4. Using Cofactors of elements of third column, evaluate $\Delta = |1xyz1yzx1zxy|$

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5. Let $\Delta_0 = \begin{vmatrix} a_{11} & a_{12} & a_{13} \\ a_{21} & a_{22} & a_{23} \\ a_{31} & a_{32} & a_{33} \end{vmatrix}$, (where $\Delta_0 \neq 0$) and let Δ_1 denote the determinant formed by the cofactors of elements of Δ_0 and Δ_2 denote the determinant formed by the cofactors at Δ_1 and so on Δ_n denotes the determinant formed by the cofactors at Δ_{n-1} then the determinant value of Δ_n is (A) $(\Delta_0)^{2n}$ (B) $(\Delta_0)^{2^n}$ (C) $(\Delta_0)^2$ (D) $(\Delta_0)^{n^2}$

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. $a_{11}A_{11} + a_{21}A_{21} + a_{31}A_{31}$

Answer: D

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Exercise 4 5

1. Find the adjoint of each of the matrices in questions 1 and 2.

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

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2. Find the adjoint of the matrices

$$\begin{bmatrix} 1 & -1 & 2 \\ 2 & 3 & 5 \\ -2 & 0 & 1 \end{bmatrix}$$

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3. Verify A (adj A) = (adj A) A= |A| I in Excercises 3 and 4 $\begin{bmatrix} 2 & 3 \\ -4 & -6 \end{bmatrix}$

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4. If $A = \begin{pmatrix} 1 & -1 & 2 \\ 3 & 0 & -2 \\ 1 & 0 & 3 \end{pmatrix}$, verify that A (adj A) = $|A| \cdot I$.

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5. Find the inverse of each of the matrices (if it exists)

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

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6. Find the inverse of each of the matrices given below :

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

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7. Find the inverse of each of the matrices (if it exists)

$$\begin{bmatrix} 1 & 2 & 3 \\ 0 & 2 & 4 \\ 0 & 0 & 5 \end{bmatrix}$$

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8. Find the inverse of each of the matrices (if it exists)

$$\begin{bmatrix} 1 & 0 & 0 \\ 3 & 3 & 0 \\ 5 & 2 & -1 \end{bmatrix}$$

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9. Find the inverse of each of the matrices (if it exists)

$$\begin{bmatrix} 2 & 1 & 3 \\ 4 & -1 & 0 \\ -7 & 2 & 1 \end{bmatrix}$$

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10. Find the inverse of each of the matrices given below :

Computer

$(AB)^{-1} when A = \begin{bmatrix} 1 & 1 & 2 \\ 0 & 2 & -3 \\ 3 & -2 & 4 \end{bmatrix}$ and $B^{-1} = \begin{bmatrix} 1 & 2 & 0 \\ 0 & 3 & -1 \\ 1 & 0 & 2 \end{bmatrix}$.

Find $A^{-1}. Then,$ (AB)^(-1)=B^(-1)A^(-1)`.

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11. Find the inverse the matrix (if it exists)given in

$[0000 \cos\alpha \sin\alpha 0 \sin\alpha - \cos\alpha]$

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12. Let $A = [3725]$and $B = [6879]$. Verify that $(AB)^{-1} = B^{-1}A^{-1}$.

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13. if $A = \begin{bmatrix} 3 & 1 \\ -1 & 2 \end{bmatrix}$, show that $A^2 - 5A + 7I = 0$.

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14. Solve system of linear equations, using matrix method,

$xy + 2z = 7 \quad 3x + 4y \quad 5z = 5$

$2xy + 3 \quad z = 12$

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15. For the matrix $A = [11112 - 32 - 13]$. Show that

$A^3 - 6A^2 + 5A + 11 I_3 = O$. Hence, find A^{-1} .

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16. If $A = [2 - 11 - 12 - 11 - 12]$. Verify that

$A^3 - 6A^2 + 9A - 4I = O$ and hence find A^{-1} .

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17. 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. $3|A|$

Answer: B

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18. 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

A. det (A)

B. $\frac{1}{\det(A)}$

C. 1

D. 0

Answer: B

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Exercise 4 6

1. Examine the consistency of the system of equations $x + 2y = 2$

$2x + 3y = 3$

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2. Examine the consistency of the system of equations $2x - y = 5$

$x + y = 4$

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3. Examine the consistency of the system of equations $x + 3y = 5, 2x + 6y = 8$

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4. Examine the consistency of the system of equations $x + y + z = 1$ $2x + 3y + 2z = 2$ $ax + ay + 2a z = 4$

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5. Examine the consistency of the system of equations$3xy2z = 22yz = 1$ $3x5y = 3$

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6. Examine the consistency of the system of equations in questions 1 to 6.

5x-y+4z=5, 2x+3y+5z=2, 5x-2y+6z=-1

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7. Solve system of linear equations, using matrix method, $5x + 2y = 4$

$7x + 3y = 5$

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8. Solve system of linear equations, using matrix method,

$2. x \quad y = 2 \; 3x + 4y = 3$

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9. Solve system of linear equations, using matrix method, $4x3y = 3$

$3x5y = 7$

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10. Solve system of linear equations, using matrix method, $5x + 2y = 3$

$3x + 2y = 5$

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11. Solve system of linear equations, using matrix method, $2x + y + z = 1$

$x - 2y - z = \frac{3}{2} 3y - 5z = 9$

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12. Solve system of linear equations, using matrix method,

$xy + z = 4 \quad 2x + y \quad 3z = 0$

$x + y + z = 2$

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13. Solve system of linear equations, using matrix method,

$2x + 3y + 3z = 5x - 2y + z = -43x - y2z = 3$

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14. Solve system of linear equations, using matrix method, in questions 7 to 14.

x-y+2z=7, 3x+4y-5z=-5, 2x-y+3z=12

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15. If $A = \begin{bmatrix} 2 & -3 & 5 \\ 3 & 2 & -4 \\ 1 & 1 & -2 \end{bmatrix}$, find A^{-1} Using A^{-1} solve the following system of equations :

$2x - 3y + 5z = 16 : 3x + 2y = -4; x + y - 2z = -3$

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16. The cost of 4 kg onion, 3 kg wheat and 2 kg rice is Rs 60. The cost of 2 kg onion, 4 kg wheat and 6 kg rice is Rs 90. The cost of 6 kg onion 2 kg wheat and 3 kg rice is Rs 70. Find cost of each item per kg by matrix method.

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Miscellaneous Exercises On Chapter 4

1. Prove that the determinant

$$\Delta = \begin{vmatrix} x & \sin 0 & \cos 0 \\ -\sin 0 & -x & 1 \\ \cos 0 & 1 & x \end{vmatrix}$$

is independent of 0 .

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2. Without expanding the determinant, prove that

$$\begin{bmatrix} a & a^2 & bc \\ b & b^2 & ca \\ c & c^2 & ab \end{bmatrix} = \begin{bmatrix} 1 & a^2 & a^3 \\ 1 & b^2 & b^3 \\ 1 & c^2 & c^3 \end{bmatrix}$$

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3. Evaluate

$$|\cos\alpha\cos\beta\cos\alpha\sin\beta - \sin\alpha - \sin\beta\cos\beta 0\sin\alpha\cos\beta\sin\alpha\sin\beta\cos\alpha|$$

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4. If a, b and c are real numbers, and $\Delta = |b + + aa + bc + aa + + ca + + + a| = 0$ .Show that either $a + b + c = 0$ or $a = b = c$.

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5. Solve the equation $|x + a \times \times + a \times \times + a| = 0, a \neq 0$

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6. Prove that :

(i) $\begin{vmatrix} a & c & a+c \\ a+b & b & a \\ b & b+c & c \end{vmatrix} = 2abc$

(ii) Prove that : $\begin{vmatrix} a^2 & bc & ac+c^2 \\ a^2+ab & b^2 & ac \\ ab & b^2+bc & c^2 \end{vmatrix} = 4a^2b^2c^2$

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7. If $A^{-1} = [3 - 11 - 156 - 55 - 22]$ and $B = [12 - 2 - 1300 - 21]$, find $(AB)^{-1}$.

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8. Evaluate $\begin{vmatrix} x & y & x+y \\ y & x+y & x \\ x+y & x & y \end{vmatrix}$

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9. Evaluate the following: $\begin{vmatrix} 1 & x & y \\ 1 & x+y & y \\ 1 & x & x+y \end{vmatrix}$

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10. Using peoperties of determinants in questions 11 to 15, prove that :

$$\begin{vmatrix} \alpha & \alpha^2 & \beta+\gamma \\ \beta & \beta^2 & \gamma+\alpha \\ \gamma & \gamma^2 & \alpha+\beta \end{vmatrix} = (\beta-\gamma)(\gamma-\alpha)(\alpha-\beta+\gamma)$$

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11. Using properties of determinants. Prove that

$$\left| \times^2\ 1+px^3yy^21+py^3zz^21+pz^3 \right| = (1+pxyz)(x-y)(y-z)(z-x)$$

, where p is any scalar.

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12. Show that:

$$\begin{vmatrix} 3a & -a+b & -a+c \\ -b+a & 3b & -b+c \\ -c+a & -c+b & 3c \end{vmatrix} = 3(a+b+c)(ab+bc+ca) \cdot$$

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13. Show that

$|11 + p1 + p + q23 + 2p1 + 3p + 2q36 + 3p106p + 3q| = 1.$

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14. Without expanding, show that the value of each of the determinants is zero: $|\sin\alpha\cos\alpha\cos(\alpha+\delta)\sin\beta\cos\beta\cos(\beta+\delta)\sin\gamma\cos\gamma\cos(\gamma+\delta)|$

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15. Solve the system of equations $\frac{2}{x} + \frac{3}{y} + \frac{10}{z} = 4\frac{4}{x} - \frac{6}{y} + \frac{5}{z} = 1$ $\frac{6}{x} + \frac{9}{y} - \frac{20}{z} = 2$

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16. Choose the correct answer in questions 17 to 19:

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

(a) 0

(b) 1

(c) x

(d) 2x

A. 0

B. 1

C. x

D. $2x$

Answer: A

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17. Choose the correct answer in questions 17 to 19:

If x, y, z are nonzero real numbers then the inverse of metrix $A = \begin{bmatrix} x & 0 & 0 \\ 0 & y & 0 \\ 0 & 0 & z \end{bmatrix}$ 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) $\frac{1}{xyz} \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$

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. $\frac{1}{xyz} \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$

Answer: A

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18. Let $A = \begin{bmatrix} 1 & \sin\theta & 1 \\ -\sin\theta & 1 & \sin\theta \\ -1 & -\sin\theta & 1 \end{bmatrix}$, where $0 \leq \theta < 2\pi$. then, which of the following is not correct ?

A. $Det(A) = 0$

B. $Det(A) \in (2, \infty)$

C. $Det(A) \in (2, 4)$

D. $Det(A) \in [2, 4]$

Answer: D

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