Complex Number
सम्मिश्र संख्याएं

(1) The value of $(1+i)^5 \times (1-i)^5$ is (a) -8 (b) 8i (c) 8 (d) 32

(2) If $x-iy = \sqrt{\frac{a-ib}{c-id}}$ then find the value of $(x^2+y^2)^2$

यदि $x-iy = \sqrt{\frac{a-ib}{c-id}}$ तो $(x^2+y^2)^2$ का मान होगा?

(a) $\frac{a^2+b^2}{c^2+d^2}$ (b) $\frac{a^2-b^2}{c^2-d^2}$ (c) $\frac{c^2+d^2}{a^2+b^2}$ (d) $\frac{c^2-d^2}{a^2+b^2}$

(3) find the Modulus of $\frac{1+i}{1-i} - \frac{1-i}{1+i}$ (a) 1 (b) 2 (c) -1 (d) -2

$\frac{1+i}{1-i} - \frac{1-i}{1+i}$ का मापांक क्या है।

(4) If $x+iy = \frac{a+ib}{a-ib}$ find the value of x^2+y^2 (a) 1 (b) 0 (c) -1 (d) 2

(5) If α and β are imaginary cube roots of unity then $\alpha^4+\beta^4+\frac{1}{\alpha\beta}$ is

यदि α व β इकाई के सम्मिश्र घनमूल है तो $\alpha^4+\beta^4+\frac{1}{\alpha\beta}$ का मान है

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

(6) If $z = \frac{\sqrt{3}+i}{\sqrt{3}-i}$ The find the amplitude of z is

यदि $z = \frac{\sqrt{3}+i}{\sqrt{3}-i}$ तो z का कोणांक क्या होगा?

(a) $\frac{\pi}{2}$ (b) $\frac{\pi}{3}$ (c) $\frac{\pi}{6}$ (d) $\frac{\pi}{4}$

(7) If $\frac{1+2i}{2+i} = r(\cos\theta + i\sin\theta)$ then (d) N.O.T

(a) $r=1, \theta = \tan^{-1}\frac{3}{4}$ (b) $r=\sqrt{5}\ \theta = \tan^{-1}\frac{4}{3}$ (c) $r=1, \theta = \tan^{-1}\frac{4}{3}$

(8) If $z=x+iy$ satisfied $\text{amp}(z-1) = \text{amp}(z+3i)$ then the value of $(x-1):y$ is equal to

यदि $z=x+iy$ $\text{amp}(z-1) = \text{amp}(z+3i)$ को सन्तुष्ट करता है तो $(x-1):y$ का मान होगा? (a) 2:1 (b) 1:3 (c) -1:3 (d) 2:3

(9) If w is an Imaginary cube root of unity then $(1+w-w^2)^7$ equals

यदि w इकाई का घनमूल है तो $(1+w-w^2)^7$ का मान क्या होगा?

(a) $128w$ (b) $-128w$ (c) $128w^2$ (d) $-128w^2$

(10) If w is a cube root of unity then find $(1-w)(1-w^2)(1+w^4)(1+w^8)$

यदि w इकाई का घनमूल है तो $(1-w)(1-w^2)(1+w^4)(1+w^8)$ का मान है

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

(11) If w is cube root unity find $\frac{1+2w+3w^2}{2+3w+w^2} + \frac{2+3w+w^2}{3+w+2w^2}$

(12) $\left|\frac{z-1}{z+1}\right| = 1$ represent. (a) circle (b) st line (c) an ellips (d) Hyperbola

$\left|\frac{z-3i}{z+3i}\right| = 1$ represent (a) circle (b) st line (c) ellips (d) Hyperbola

Matrices

① If $A=\begin{bmatrix}0 & 2 & 3\\ 2 & 1 & 4\end{bmatrix}$ $B=\begin{bmatrix}7 & 6 & 3\\ 1 & 4 & 5\end{bmatrix}$ And $3A-2B$

(A) $\begin{bmatrix}-14 & 6 & -2\\ 4 & 5 & 2\end{bmatrix}$ (B) $\begin{bmatrix}14 & -6 & -3\\ -4 & -5 & -2\end{bmatrix}$ (C) $\begin{bmatrix}-14 & -6 & 3\\ 4 & -5 & 2\end{bmatrix}$ (D) $\begin{bmatrix}14 & 6 & -3\\ 4 & 5 & -2\end{bmatrix}$

② Find X and Y If $X+Y=\begin{bmatrix}5 & 2\\ 0 & 9\end{bmatrix}$, $X-Y=\begin{bmatrix}3 & 6\\ 0 & -1\end{bmatrix}$

(a) $X=\begin{bmatrix}4 & 4\\ 0 & 4\end{bmatrix}$ $Y=\begin{bmatrix}1 & -2\\ 0 & 5\end{bmatrix}$ (b) $X=\begin{bmatrix}-4 & -4\\ 0 & -4\end{bmatrix}$ $Y=\begin{bmatrix}-1 & 2\\ 0 & -5\end{bmatrix}$

(c) $X=\begin{bmatrix}4 & -4\\ 0 & 4\end{bmatrix}$, $Y=\begin{bmatrix}-1 & -2\\ 0 & -5\end{bmatrix}$ (d) $X=\begin{bmatrix}4 & 0\\ 4 & 4\end{bmatrix}$ $Y=\begin{bmatrix}-1 & 0\\ -2 & 5\end{bmatrix}$

③ If $A=\begin{bmatrix}1 & 2\\ 2 & 3\end{bmatrix}$ and $A^2-KA-I_2=0$ find K

(a) 4 (b) −4 (c) 8 (d) −8

④ If $A=\begin{bmatrix}3 & -2\\ 4 & -2\end{bmatrix}$ and $A^2=KA-2I_2$ find K.

(a) $K=1$ (b) $K=2$ (c) $K=0$ (d) $K=3$

⑤ For what value of x: $\begin{bmatrix}1 & 2 & 1\end{bmatrix}\begin{bmatrix}1 & 2 & 0\\ 2 & 0 & 1\\ 1 & 0 & 2\end{bmatrix}\begin{bmatrix}0\\ 2\\ x\end{bmatrix}=0$

(a) $x=1$ (b) $x=-1$ (c) $x=0$ (d) $x=2$

⑥ If $A=\begin{bmatrix}\cos\theta & \sin\theta\\ -\sin\theta & \cos\theta\end{bmatrix}$, then $A^2=I$ is true for

(a) $\theta=0$ (b) $\theta=\pi/4$ (c) $\theta=\pi/2$ (d) $\theta=\pi/3$

⑦ If the matrix $A=\begin{bmatrix}\alpha & \beta\\ \beta & \alpha\end{bmatrix}$ is such that $A^2=I$ then which one of the following is correct.

(A) $\alpha=0, \beta=1$ or $\alpha=1, \beta=0$ (B) $\alpha=0, \beta\neq 1$ or $\alpha\neq 1, \beta=1$

(C) $\alpha=1, \beta\neq 0$ or $\alpha\neq 1, \beta=1$ (D) $\alpha\neq 0, \beta\neq 0$

⑧ The matrix $\begin{bmatrix}5 & 10 & 3\\ -2 & -4 & 6\\ -1 & -2 & b\end{bmatrix}$ is singular matrix equal to

(a) −3 (b) 3 (c) 0 (d) for any value of b.

⑨ If $\begin{bmatrix}1 & -3 & 2\\ 2 & -8 & 5\\ 4 & 2 & \lambda\end{bmatrix}$ is not invertible matrix, Then what is the value of λ.

⑩ If $A=\begin{bmatrix}\alpha & 0\\ 1 & 1\end{bmatrix}$ $B=\begin{bmatrix}1 & 0\\ 2 & 1\end{bmatrix}$ such that $A^2=B$ then what is the value of α? (a) −1 (b) 1 (c) 2 (d) 4

(11) If $A=\begin{bmatrix}1 & 2\\ 3 & -5\end{bmatrix}$, then A^{-1} is equal to

(a) $\begin{bmatrix}-5 & -2\\ -3 & 1\end{bmatrix}$ (b) $\begin{bmatrix}\frac{5}{11} & \frac{2}{11}\\ \frac{3}{11} & -\frac{1}{11}\end{bmatrix}$ (c) $\begin{bmatrix}-\frac{5}{11} & -\frac{2}{11}\\ -\frac{3}{11} & -\frac{1}{11}\end{bmatrix}$ (d) $\begin{bmatrix}5 & 2\\ 3 & -1\end{bmatrix}$

(12) If $A=\begin{bmatrix}1 & 2\\ 2 & -1\end{bmatrix}$ then A^{-1} is equal to

(a) $\frac{1}{5}\begin{bmatrix}1 & 2\\ 2 & -1\end{bmatrix}$ (b) $\frac{1}{5}\begin{bmatrix}1 & 2\\ 2 & -1\end{bmatrix}$ (c) $\frac{1}{5}\begin{bmatrix}-1 & 2\\ 2 & 1\end{bmatrix}$ (d) $\frac{1}{5}\begin{bmatrix}-1 & -2\\ -2 & -1\end{bmatrix}$

(13) If $A=\begin{bmatrix}1 & 2 & 2\\ 2 & 1 & 2\\ 2 & 2 & 1\end{bmatrix}$ Then find A^{-1} (a) $\frac{1}{5}\begin{bmatrix}-3 & 2 & 2\\ 2 & -3 & 2\\ 2 & 2 & -3\end{bmatrix}$ (b) $\frac{1}{5}\begin{bmatrix}2 & -3 & -3\\ -3 & 2 & -3\\ -3 & -3 & 2\end{bmatrix}$

(c) $\begin{bmatrix}1 & 2 & 3\\ 2 & 3 & 4\\ 4 & 5 & 6\end{bmatrix}$ (d) $\frac{1}{5}\begin{bmatrix}1 & 2 & 3\\ 2 & 3 & 4\\ 3 & 4 & 5\end{bmatrix}$

(14) If $A=\begin{bmatrix}1 & 2 & -2\\ -1 & 3 & 0\\ 0 & -2 & 1\end{bmatrix}$ And A^{-1} (a) $\begin{bmatrix}3 & 2 & 6\\ 1 & 1 & 2\\ 2 & 2 & 5\end{bmatrix}$ (b) $\begin{bmatrix}2 & 3 & 4\\ 3 & 4 & 5\\ 3 & 2 & 1\end{bmatrix}$

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

(15) If $\begin{bmatrix}1 & 1 & 1\\ 1 & -2 & -2\\ 1 & 3 & 1\end{bmatrix}\begin{bmatrix}x\\ y\\ z\end{bmatrix}=\begin{bmatrix}0\\ 3\\ 4\end{bmatrix}$ Then $\begin{bmatrix}x\\ y\\ z\end{bmatrix}$ is equal to

(a) $\begin{bmatrix}0\\ 1\\ 1\end{bmatrix}$ (b) $\begin{bmatrix}1\\ 2\\ -3\end{bmatrix}$ (c) $\begin{bmatrix}5\\ -2\\ 1\end{bmatrix}$ (d) $\begin{bmatrix}1\\ -2\\ 3\end{bmatrix}$

(16) If a matrix A is such that $3A^3+2A^2+5A+I=0$ then what is A^{-1} (a) $-(3A^2+2A+5)$ (b) $3A^2+2A+5I$ (c) $3A^2-2A-5I$ (d) $-(3A^2+2A+5I)$

(17) A and B are two matrices such that $AB=A$ and $BA=A$. Then what is value of B^2 (a) B (b) A (c) I (d) 1

(18) If $A=\begin{bmatrix}w & 0\\ 0 & w\end{bmatrix}$ where w is cube root unity find A^{100}
(a) A (b) $-A$ (c) Null matrix (d) Identity matrix

(19) Let $A=\begin{bmatrix}1 & 2\\ 3 & 4\end{bmatrix}=[a_{ij}]$. If its inverse matrix is $[b_{ij}]$, find b_{22}
(a) -2 (b) 1 (c) $\frac{3}{2}$ (d) $-\frac{1}{2}$

(20) If $A=\begin{bmatrix}2x & 0\\ x & x\end{bmatrix}$ and $A^{-1}=\begin{bmatrix}1 & 0\\ -1 & 2\end{bmatrix}$ then find x.
(a) $-\frac{1}{2}$ (b) $\frac{1}{2}$ (c) 1 (d) 2.

Determinants (सारणिक)

① If $\begin{vmatrix} a & b & c \\ m & n & p \\ x & y & z \end{vmatrix} = K$, Then $\begin{vmatrix} 6a & 2b & 2c \\ 3m & n & p \\ 3x & y & z \end{vmatrix}$ is equal to

(a) $\frac{K}{6}$ (b) $2K$ (c) $3K$ (d) $6K$

② The value of $\begin{vmatrix} 5^2 & 5^3 & 5^4 \\ 5^3 & 5^4 & 5^5 \\ 5^4 & 5^5 & 5^6 \end{vmatrix}$, is (a) 5^2 (b) 0 (c) 5^{13} (d) 5^9

③ If w is a complex cube root of unity then the value of determinant $\Delta = \begin{vmatrix} 1 & w & w^2 \\ w & w^2 & 1 \\ w^2 & 1 & w \end{vmatrix}$ (a) 1 (b) 0 (c) w^2 (d) w

④ The value of $\Delta = \begin{vmatrix} 1 & a & b+c \\ 1 & b & c+a \\ 1 & c & a+b \end{vmatrix}$, is (a) 1 (b) -1 (c) $a+b+c$ (d) 0

⑤ The value of $\Delta = \begin{vmatrix} b-c & c-a & a-b \\ c-a & a-b & b-c \\ a-b & b-c & c-a \end{vmatrix}$ (a) $a+b+c$ (b) 0 is (c) 1 (d) N.O.T

⑥ The value of $\Delta = \begin{vmatrix} \sin\alpha & \cos\alpha & \sin(\alpha+\delta) \\ \sin\beta & \cos\beta & \sin(\beta+\delta) \\ \sin\gamma & \cos\gamma & \sin(\gamma+\delta) \end{vmatrix}$ (a) 0 (b) 1 is (c) 2 (d) 3

⑦ The value of $\begin{vmatrix} 1 & a & a^2 \\ 1 & b & b^2 \\ 1 & c & c^2 \end{vmatrix}$, is (a) $(a-b)(b-c)(c-a)$ (d) N.O.T (b) $(a^2-b^2)(b^2-c^2)(c^2-a^2)$ (c) $(a+b-c)(b+c-a)(c+a-b)$

⑧ $\Delta = \begin{vmatrix} a+x & b & c \\ b & x+c & a \\ c & a & x+b \end{vmatrix}$ which of the following is a factor for the above determinant.

(a) $x-(a+b+c)$ (b) $x+(a+b+c)$ (c) $a+b+c$ (d) $-(a+b+c)$

⑨ The value of $\begin{vmatrix} a^2 & -ab & -ac \\ -ab & b^2 & -bc \\ ca & bc & -c^2 \end{vmatrix}$ is, (a) $4a^2b^2$ (b) $4b^2c^2$ (c) $4c^2a^2$ (d) $4a^2b^2c^2$

⑩ The value of $\Delta = \begin{vmatrix} 1 & 1+ac & 1+bc \\ 1 & 1+ad & 1+bd \\ 1 & 1+ae & 1+be \end{vmatrix}$ (a) 1 (b) 0 is (c) 3 (d) $a+b+c$

(11) find the value of $\begin{vmatrix} 1 & 1 & 1 \\ 1 & 1+a & 1 \\ 1 & 1 & 1+b \end{vmatrix}$

(a) 1 (b) 0 (c) ab (d) N.O.T

(12) find the value of $\begin{vmatrix} 1 & 1 & 1 \\ 1 & 6 & 1 \\ 1 & 1 & 7 \end{vmatrix}$

(a) 30 (b) 42
(c) 13 (d) 14

(13) find the value of $\begin{vmatrix} \frac{1}{a} & a & bc \\ \frac{1}{b} & b & ca \\ \frac{1}{c} & c & ab \end{vmatrix}$

(a) 1 (b) 0
(c) abc (d) N.O.T