RAMA STUDY CENTRE WHATSAPP-8754834604

MINIMUM STUDY MATERIAL FOR QUARTERLY EXAM

12th STANDARD - MATHS

CHAPTER - 1

1) Prove and state reverse law for inverse

2) If $\operatorname{adj} A = \begin{bmatrix} -1 & 2 & 2 \\ 1 & 1 & 2 \\ 2 & 2 & 1 \end{bmatrix}$ find A^{-1}

3) $A = \begin{bmatrix} 4 & 3 \\ 2 & 5 \end{bmatrix}$ find x and y such that $A^2 + xA + yI_2 = O_2$, $A^{-1} = ?$

4) Prove that $\begin{bmatrix} \cos\theta & -\sin\theta \\ \sin\theta & \cos\theta \end{bmatrix}$ is orthogonal

5) Find the matrix A for which $A \times \begin{bmatrix} 5 & 3 \\ -1 & -2 \end{bmatrix} = \begin{bmatrix} 14 & 7 \\ 7 & 7 \end{bmatrix}$

6) Find the rank of matrix $\begin{bmatrix} 4 & 3 & 1 & -2 \\ -3 & -1 & -2 & 4 \\ 6 & 7 & -1 & 2 \end{bmatrix}$

7) Find the inverse of $A = \begin{bmatrix} 2 & 1 & 1 \\ 3 & 2 & 1 \\ 2 & 1 & 2 \end{bmatrix}$ by Gauss Jordan Method

8) Solve the following system of linear equation by matrix inversion method $2x + 5y = -2$, $x + 2y = 3$

9) A chemist has one solution which is 50% acid and another solution 25% acid. How much each should be mixed to make 10 litres of 40% acid solution?

10) If $ax^2 + bx + c$ is divided by $x+3$, $x-5$ and $x-1$, the remainders are 21, 61 and 9 respectively find a, b, c

11) Test the consistency of system of linear equation $4x - 2y + 6z = 8$, $x + y - 3z = -1$ and $15x - 3y + 9z = 21$

12) Find the value of k, $kx - 2y + z = 1$, $x - 2yk + z = -2$, $x - 2y + kz = 1$
i) no solution ii) unique solution iii) infinetely many soln

13) By using Gaussian elimination method balance the chemical reaction equation $C_5H_8 + O_2 \rightarrow CO_2 + H_2O$

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1) Simplify the following $\sum_{n=1}^{102} i^n$

2) Find the values of real numbers x and y if the complex number $(3-i)x-(2-i)y+2i+5$ and $2x+(-1+2i)y+3+2i$ are equal

3) If $z_1 = 2+5i$, $z_2 = -3-4i$ and $z_3 = 1+i$, find the additive and multiplicative inverse of z_1, z_2 and z_3

4) A complex number z is purely imaginary if and only $z = -\bar{z}$

5) Simplify $\left(\frac{1+i}{1-i}\right)^3 - \left(\frac{1-i}{1+i}\right)^3$ into rectangular form

6) If $\frac{z+3}{z-5i} = \frac{1+4i}{2}$ find z in rectangular form

7) Find z^{-1} if $z = (2+3i)(1-i)$

8) Show i) $(2+i\sqrt{3})^{10}+(2-i\sqrt{3})^{10}$ real ii) $\left(\frac{19+9i}{5-3i}\right)^{15} - \left(\frac{8+i}{1+2i}\right)^{15}$ is purely imaginary

9) Which one of following points i, $-2+i$ and 3 is farthest from the origin?

10) If $|z| = 2$, show that $3 \le |z+3i+4| \le 7$

11) Let z_1, z_2, z_3 be complex numbers such that $|z_1| = |z_2| = |z_3| = r > 0$ and $z_1+z_2+z_3 \neq 0$. show that $\left|\frac{z_1z_2+z_2z_3+z_3z_1}{z_1+z_2+z_3}\right| = r$

12) show that the equation $z^3 + 2\bar{z} = 0$ has five solutions

13) Find the square root of $-5-12i$

14) Show that $|3z-5+i| = 4$ represents circle. Find centre, radius

15) If $z = x+iy$ is a complex number such that $\operatorname{Im}\left(\frac{2z+1}{iz+1}\right) = 0$ show that locus of z is $2x^2+2y^2+x-2y = 0$

16) If $z = x+iy$ and $\arg\left(\frac{z-1}{z+1}\right) = \frac{\pi}{2}$, show that $x^2+y^2 = 1$

17) If $(x_1+iy_1)(x_2+iy_2)\ldots(x_n+iy_n) = a+ib$, show that $(x_1^2+y_1^2)(x_2^2+y_2^2)\ldots(x_n^2+y_n^2) = a^2+b^2$

18) Find the Fourth roots of unity

19) Solve the equation $z^3+8i = 0$, where $z \in \mathbb{C}$

20) Suppose z_1, z_2 and z_3 are vertices of equivalateral triangle inscribed in circle $|z| = 2$, If $z_1 = 1+i\sqrt{3}$ find z_2 and z_3

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