RAMA STUDY CENTRE WHATSAPP - 8754 834604

MINIMUM STUDY MATERIAL FOR QUARTERLY EXAM

12th STANDARD - MATHS.

1) If α and β are the roots of quadratic equation $2x^2-7x+13=0$ construct a quadratic equation whose roots are α^2 and β^2
2) If α, β and γ are the roots of the equation $x^3+px^2+qx+r=0$ find the value of $\Sigma \frac{1}{\beta\gamma}$ in terms of co-efficients
3) Find the sum of the squares of the roots of $ax^4+bx^3+cx^2+dx+e=0$, $a \neq 0$.
4) If p is real, discuss the nature of roots of the equation $4x^2+4px+p+2=0$ in terms of p
5) Solve the equation $3x^3-16x^2+23x-6=0$ if the product of two root is 1
6) If p and q are the roots of the equation $lx^2+nx+n=0$ show that $\sqrt{\frac{p}{q}}+\sqrt{\frac{q}{p}}+\sqrt{\frac{n}{l}}=0$
7) If the equation $x^2+px+q=0$ and $x^2+p'x+q'=0$ have common root, show that it must be equal to $\frac{pq'-p'q}{q-q'}$ or $\frac{q-q'}{p'-p}$
8) Find the monic polynomial equation of minimum degree with real coefficients having $2-\sqrt{3}i$ as a root
9) Form a polynomial equation with integer coefficients with $\sqrt{2}/\sqrt{3}$ as a root
10) Show that the equation $2x^2-6x+7=0$ cannot be satisfied by any real values of x
11) Show that if p, q, r are rational, the roots of equation $x^2-2px+p^2+q^2+2qr-r^2$ are rational
12) If k is real, discuss the nature of roots of polynomial equation $2x^2+kx+k=0$ in terms of k
13) Prove that a straight line cannot intersect a circle at more than two points
14) Prove that a straight line and parabola cannot intersect at more than two points
15) Solve the equation $x^4-9x^2+20=0$
16) Obtain the condition that the roots of $x^3+px^2+qx+r=0$ are AP
17) If the roots of $x^3+px^2+qx+r=0$ are in H.P prove that $9pqr=27r^2+2q^3$. Assume $p, q, r \neq 0$
18) Find the condition that the roots of $ax^3+bx^2+cx+d=0$ are G.P

19) Solve the cubic equation $8x^3 - 2x^2 - 7x + 3 = 0$

20) Solve the cubic equation $9x^3 - 36x^2 + 44x - 16 = 0$ if the roots form an arithmetic progression

21) Solve the equation $3x^3 - 26x^2 + 52x - 24 = 0$ if its roots forms an geometric progression

22) Solve the equation $(2x-3)(6x-1)(3x-2)(x-2) - 5 = 0$

23) Find the roots of $2x^3 + 3x^2 + 2x + 3 = 0$

24) Solve the equation $7x^3 - 43x^2 = 43x - 7$

25) Find solution if any, of the equation $2\cos^2 x - 9\cos x + 4 = 0$

26) Solve the equation $6x^4 - 5x^3 - 38x^2 - 5x + 6 = 0$ if it is known that $\frac{1}{3}$ is a solution

27) Solve : $8x^{\frac{3}{2n}} - 8x^{\frac{-3}{2n}} = 63$

28) Solve : $2\sqrt{\frac{x}{a}} + 3\sqrt{\frac{a}{x}} = \frac{b}{a} + \frac{6a}{b}$

29) Show that polynomial $9x^9 + 2x^5 - x^4 - 7x^2 + 2$ has at least six imaginary roots

30) Show that the equation $x^9 - 5x^5 + 4x^4 + 2x^2 + 1 = 0$ has atleast 6 imaginary solution

31) Determine the number of positive and negative roots of the equation $x^9 - 5x^8 - 14x^7 = 0$

32) Find the exact number of real zeroes and imaginary of the polynomial $x^9 + 9x^7 + 7x^5 + 5x^3 + 3x$.

G. Rajesh M.Sc., B.Ed, MBA, MSc(psh)
MA (Eco). MA (Yoga), MA (Tam)
Dept of Mathematics

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MINIMUM STUDY MATERIAL FOR QUARTERLY EXAM

12th STANDARD – MATHS.

1) Graph the inverse sine function $\sin^{-1}: [-1,1] \to \left[\frac{-\pi}{2}, \frac{\pi}{2}\right]$

2) Find the principal value of $\sin^{-1}(2)$, if it exists

3) Find the domain of $\sin^{-1}(2-3x^2)$

4) For what values of x does $\sin x = \sin^{-1} x$?

5) Find the value of $\sin^{-1}\left(\sin\frac{5\pi}{9}\cos\frac{\pi}{9} + \cos\frac{5\pi}{9}\sin\frac{\pi}{9}\right)$

6) Graph the inverse cosine function $\cos^{-1}: [-1,1] \to [0,\pi]$

7) Find $\cos^{-1}\left(\cos\left(\frac{7\pi}{6}\right)\right)$

8) Find the domain of $\cos^{-1}\left(\frac{2+\sin x}{3}\right)$

9) Find all values of x such that $-6\pi \le x \le 6\pi$ and $\cos x = 0$

10) State the reason for $\cos^{-1}\left[\cos\left(\frac{-\pi}{6}\right)\right] \neq \frac{-\pi}{6}$

11) If $\cos^{-1}(-x) = \pi - \cos^{-1}(x)$ true? Justify your answer.

12) For what values of x, the inequality $\frac{\pi}{2} < \cos^{-1}(3x-1) < \pi$ holds?

13) Find the value of i) $\tan^{-1}\left(\tan\frac{5\pi}{4}\right)$ and ii) $\tan^{-1}\left(\tan\frac{3\pi}{6}\right)$

14) Find the value of $\tan^{-1}(-1) + \cos^{-1}(1/2) + \sin^{-1}(-1/2)$

15) Prove that $\tan(\sin^{-1}x) = \frac{x}{\sqrt{1-x^2}}, -1 < x < 1$

16) Find the value of $\cos\left(\sin^{-1}\frac{4}{5} - \tan^{-1}\frac{3}{4}\right)$

17) If $\cot^{-1}(1/7) = \theta$, find the value of $\cos\theta$

18) Show that $\cot^{-1}\left(\frac{1}{\sqrt{x^2-1}}\right) = \sec^{-1}x, |x|>1$

19) Find the value of $\cot^{-1}(1) + \sin^{-1}(-\sqrt{3}/2) - \sec^{-1}(-\sqrt{2})$

20) Prove $\sin^{-1}x + \sin^{-1}y = \sin^{-1}\left(x\sqrt{1-y^2} + y\sqrt{1-x^2}\right)$

21) Prove that $\frac{\pi}{2} \le \sin^{-1}x + 2\cos^{-1}x \le 3\pi/2$

22) Simplify i) $\sin^{-1}[\sin 10]$ and ii) $\sin^{-1}[\sin 5]$

23) Find the value of $\cos\left[\frac{1}{2}\cos^{-1}(1/8)\right]$

24) Prove that $\tan(\sin^{-1}x) = \frac{x}{\sqrt{1-x^2}}$ for $|x|<1$

25) If $\cos^{-1}x + \cos^{-1}y + \cos^{-1}z = \pi$ and $0 < x, y, z < 1$ show that $x^2+y^2+z^2+2xyz = 1$

26) Prove that $2\tan^{-1}\frac{1}{2} + \tan^{-1}\frac{1}{7} = \tan^{-1}\frac{31}{17}$

27) If $a_1, a_2, a_3 \ldots a_n$ is an A.P with common difference d prove that $\tan\left[\tan^{-1}\left(\frac{d}{1+a_1a_2}\right) + \tan^{-1}\left(\frac{d}{1+a_2a_3}\right) + \ldots \tan^{-1}\left(\frac{d}{1+a_na_{n-1}}\right)\right] = \frac{a_n - a_1}{1+a_1a_n}$

28) show that $\cot(\sin^{-1}x) = \frac{\sqrt{1-x^2}}{x}$, $-1 \le x < 1$ and $x \neq 0$

29) Solve $\tan^{-1}2x + \tan^{-1}3x = \frac{\pi}{4}$. if $6x^2 < 1$

30) solve $\tan^{-1}\left(\frac{x-1}{x-2}\right) + \tan^{-1}\left(\frac{x+1}{x+2}\right) = \frac{\pi}{4}$

31) Solve $\cos\left(\sin^{-1}\left(\frac{x}{\sqrt{1+x^2}}\right)\right) = \sin\left\{\cot^{-1}\left(\frac{3}{4}\right)\right\}$

32) Prove that $\tan^{-1}x + \tan^{-1}y + \tan^{-1}z = \tan^{-1}\left[\frac{x+y+z-xyz}{1-xy-yz-zx}\right]$

33) Solve $2\tan^{-1}x = \cos^{-1}\frac{1-a^2}{1+a^2} - \cos^{-1}\frac{1-b^2}{1+b^2}$, $a>0, b>0$

34) Find the number of solution of the equation $\tan^{-1}(x-1) + \tan^{-1}x + \tan^{-1}(x+1) = \tan^{-1}(3x)$.

G. Rajesh M.Sc, B.Ed, MBA, MSc(psh) MA(Eco), MA(Yoga), MA(Tam) Dept of mathematics.