Class: X

Subject : Maths (HAP)

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WORKSHEET

THEORY OF EQUATIONS

1. If α, β are real and $\alpha^2, -\beta^2$ and the roots of $a^2x^2 + x + 1 - a^2 = 0$ (a>1) then $\beta^2 = ...$

   (Ans: 1)

2. If K>0 and the product of the roots of the equation $x^2 - 3kx + 2e^{2\log k} - 1 = 0$ then the sum of the roots is ..... (Ans: 6)

3. If the sum of the squares of the roots of $x^2 + px - 3 = 0$ is 10 then the value of p is .....

   (Ans: ± 2)

4. If α, β are the roots of $a(x^2 + m^2) + amx + bm^2x^2 = 0$ then

   $a(\alpha^2 + \beta^2) + a\alpha\beta + b\beta^2\alpha^2 = ...$ (Ans: 0)

5. If α, β are the roots of $x^2 + ax - b = 0$ and γ, δ are the roots of $x^2 + ax + b = 0$ then

   $(\alpha - \gamma)(\beta - \delta)(\alpha - \delta)(\beta - \gamma) = ...$ (Ans: $4b^2$)

6. If 8 and 2 are the roots of $x^2 + ax + \beta = 0$ and 3,3 are the roots of $x^2 + \alpha x + b = 0$ then the roots of the equation $x^2 + ax + b = 0$ are ..... (Ans: 9, 1)

7. If α, β are the roots of $2x^2 + 3x - 4 = 0$ then the equation having roots

   $2\alpha + \frac{3}{\beta}$, $2\beta + \frac{3}{\alpha}$ is ..... (Ans: $4x^2 + 3x - 2 = 0$)

8. If one root of $x^2 + Kx + 27 = 0$ may be the triple the other root, then K= ... (Ans: 12)

9. If condition that $\sin\theta, \cos\theta$ may be roots of $ax^2 + bx + c = 0$ is .... (Ans: $a(a+2c)=b^2$)

10. The maximum value of $4x - 5x^2 - 1$ is ..... (Ans: $-\frac{1}{5}$)

11. The minimum value of $x^2 - 8x + 17$, $\forall x \in R$ is ..... (Ans: 1)

12. If $x^2 + 6x - 27 > 0$, $-x^2 + 3x + 4 > 0$ then x lies in the interval .... [Ans: (3,4)]

13. If x is real, then the value of $\frac{x^2 - 3x + 4}{x^2 + 3x + 4}$ lies in the interval ..... [Ans: $\left(\frac{1}{7}, 7\right)$]

contd.....

14. The biquadratic equation, two of whose roots are 1+i, 1-$\sqrt{2}$ is ....

[Ans: $(x^4-4x^3+5x^2-2x-2=0)$]

15. If α,β are the roots of $x^2-2x+4=0$ then $\alpha^5+\beta^5=$..... (Ans: 32)

16. If α,β are the roots of $x^2-x+1=0$ then $\alpha^{2018}+\beta^{2018}=$..... (Ans: 1)

17. If α,β are the roots of $9x^2+6x+1=0$ then the equation whose roots are $\frac{1}{\alpha},\frac{1}{\beta}$ is .....

(Ans: $x^2+6x+9=0$)

18. If both the roots of the quadratic equation $x^2-2Kx+K^2+K-5=0$ are less than 5, then K less in the interval..... [Ans: $(-\infty,4)$]

19. The roots of $3x^2+4x-5=0$ are ..... (Ans: irrational)

20. If the roots of $12x^2+Kx+5=0$ are in the ratio 3 : 2 then K=..... (Ans: $\pm5\sqrt{10}$)

21. If $x^2-hx-21=0,\ x^2-3hx+35=0$ have a common root then h= .... (Ans: ±4)

22. If $|x|^2-3|x|+2=0$ then $x=$..... (Ans: ±1 or ±2)

23. If $x^2-(5m-2)x+4m^2+10m+25=0$ is a perfect square, then K= ..... (Ans: $8,-\frac{4}{3}$)

24. If $-3<x<1$ then the value of $3-2x-x^2$ is ..... (Ans: positive

25. If a > 0; and $b^2-4ac=0$ then the curve $y=ax^2+bx+c$.....

(Ans: touches the x-axis and lies above it)

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