DPP
DAILY PRACTICE PROBLEMS

CLASS : XIth
DATE :

Solutions

SUBJECT : MATHS
DPP NO. : 9

Topic :- COMPLEX NUMBERS AND QUADRATIC EQUATIONS

1. If α_1,α_2 and β_1,β_2 are the roots of the equation $ax^2+bx+c=0$ and $px^2+qx+r=0$ respectively and system of equations $\alpha_1 y+\alpha_2 z=0$ and $\beta_1 y+\beta_2 z=0$ has a non-zero solution, then

a) $a^2qc=p^2br$ b) $b^2=pr=q^2ac$ c) $c^2=ar=r^2pb$ d) None of these

2. If $1, \omega, \omega^2$ are the cube roots of unity, then $(1-\omega+\omega^2)(1-\omega^2+\omega^4)(1-\omega^4+\omega^8)(1-\omega^8+\omega^{16})$... upto $2n$ factors is

a) $2n$ b) 2^{2n} c) 1 d) -2^{2n}

3. If α and β are different complex numbers with $|\beta|=1$, then $\left|\frac{\beta-\alpha}{1-\bar{\alpha}\beta}\right|$ is

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

4. In a right-angled triangle, the sides are a, b and c, with c as hypotenuse, and $c-b\neq 1$, $c+b\neq 1$. Then the value of $(\log_{c+b} a+\log_{c-b} a)/(2\log_{c+b} a\times \log_{c-b} a)$ will be

a) 2 b) -1 c) $\frac{1}{2}$ d) 1

5. The set of real values of x for which $\frac{10x^2+17x-34}{x^2+2x-3}<8$, is

a) $(-5/2, 2)$ b) $(-3, -5/2)\cup(1, 2)$ c) $(-3, 1)$ d) None of these

6. If $\left(\frac{1+\cos\phi+i\sin\phi}{1+\cos\phi-i\sin\phi}\right)=u+iv$, where u and v all real numbers, then u is

a) $n\cos\phi$ b) $\cos n\phi$ c) $\cos\left(\frac{n\phi}{2}\right)$ d) $\sin\left(\frac{n\phi}{2}\right)$

7. The number of real roots of the equation $2x^4+5x^2+3=0$, is

a) 4 b) 1 c) 0 d) 3

8. If α and β are the roots of $x^2-2x+4=0$, then the value of $\alpha^6+\beta^6$ is

a) 32 b) 64 c) 128 d) 256

9. If $|z+4|\leq 3$, then the greatest and the least value of $|z+1|$ are

a) $6, -6$ b) $6, 0$ c) $7, 2$ d) $0, -1$

10. If P,P' represent the complex number z_1 and its additive inverse respectively, then the equation of the circle with PP' as a diameter is

a) $\frac{z}{z_1}=\frac{\bar{z}_1}{z}$ b) $z\bar{z}=z_1\bar{z}_1=0$ c) $z\bar{z}_1+\bar{z}z_1=0$ d) None of these

11. If $x+1$ is a factor of $x^4+(p-3)x^3-(3p-5)x^2+(2p-9)x+6$, then the value of p is

a) -4 b) 0 c) 4 d) 2

12. If $A=\{x:f(x)=0\}$ and $B=\{x:g(x)=0\}$, then $A\cap B$ will be the set of roots of the equation

a) $\{f(x)\}^2+\{g(x)\}^2=0$

b) $\frac{f(x)}{g(x)}$

c) $\frac{g(x)}{f(x)}$

d) None of these

13. If α and β are the roots of the equation $x^2+px+q=0$ and if the sum $(\alpha+\beta)x-\frac{\alpha^2+\beta^2}{2}.x^2+\frac{\alpha^3+\beta^3}{3}.x^3-\ldots$ exists then it is equal to

a) $\log(x^2+px+q)$ b) $\log(x^2-px+q)$ c) $\log(1+px+qx^2)$ d) $\log(1-px+qx^2)$

14. Let z be a complex number satisfying $|z-5i|\le 1$ such that amp (z) is minimum. Then z is equal to

a) $\frac{2\sqrt{6}}{5}+\frac{24i}{5}$ b) $\frac{24}{5}+\frac{2\sqrt{6}i}{5}$ c) $\frac{2\sqrt{6}}{5}-\frac{24i}{5}$ d) None of these

15. If α and β are the roots of $x^2+px+1=0$ and γ and δ are the roots of $x^2+qx+1=0$, then the value of $(\alpha-\gamma)(\beta-\gamma)(\alpha+\delta)(\beta+\delta)$, is

a) p^2-q^2 b) q^2-p^2 c) p^2 d) q^2

16. For two complex numbers z_1, z_2 the relation $|z_1+z_2|=|z_1|+|z_2|$ holds, if

a) $\arg(z_1)=\arg(z_2)$ b) $\arg(z_1)+\arg(z_2)=\frac{\pi}{2}$

c) $z_1z_2=1$ d) $|z_1|=|z_2|$

17. If ω is a complex cube root of unity, then $\sin\left\{(\omega^{10}+\omega^{23}\pi-\frac{\pi}{4})\right\}$ is equal to

a) $\frac{1}{\sqrt{2}}$ b) $\frac{1}{2}$ c) 1 d) $\frac{\sqrt{3}}{2}$

18. If the equation $x^3-3x+a=0$ has distinct roots between 0 and 1, then the value of a is

a) 2 b) 1/2 c) 3 d) None of these

19. If α,β are roots of the equation $375x^2-25x-2=0$ and $S_n=a^n+\beta^n$, then $\lim\limits_{n\to\infty}\sum_{r=1}^{n}S_r$ is equal to

a) 7/116 b) 1/12 c) 29/348 d) None of these

20. If $y=\tan x\cot 3x, x\in R$, then

a) $\frac{1}{3}<y<1$ b) $\frac{1}{3}\le y\le 1$ c) $\frac{1}{3}\le y\le 3$ d) None of these