DPP

DAILY PRACTICE PROBLEMS

CLASS : XIth
DATE :

Solutions

SUBJECT : MATHS
DPP NO. : 7

Topic :- COMPLEX NUMBERS AND QUADRATIC EQUATIONS

1. The values of x satisfying $|x^2+4x+3|+(2x+5)=0$ are

a) $-4, -1-\sqrt{3}$ b) $4,1+\sqrt{3}$ c) $-4,1-\sqrt{3}$ d) $-4,1+\sqrt{3}$

2. If $x=\sqrt{\frac{2+\sqrt{3}}{2-\sqrt{3}}}$, then $x^2(x-4)^2$ is equal to

a) 7 b) 4 c) 2 d) 1

3. If $|a_k|<1$, $\lambda_k \geq 0$ for $k=1, 2,\ldots,n$ and $\lambda_1+\lambda_2+\ldots\lambda_n=1$, then the value of $|\lambda_1 a_1+\lambda_2 a_2+\ldots+\lambda_n a_n|$ is

a) Equal to one b) Greater than one c) Zero d) Less than one

4. If $\tan\alpha$ and $\tan\beta$ are roots of the equation $x^2+px+q=0$ with $p\neq 0$, then

a) $\sin^2(\alpha+\beta)+p\sin(\alpha+\beta)\cos(\alpha+\beta)+q\cos^2(\alpha+\beta)=q$

b) $\tan(\alpha+\beta)=\frac{p}{q+1}$

c) $\cos(\alpha+\beta)=-p$

d) $\sin(\alpha+\beta)=1-q$

5. The amplitude of $\sin\frac{\pi}{5}+i\left(1-\cos\frac{\pi}{5}\right)$ is

a) $\frac{2\pi}{5}$ b) $\frac{\pi}{15}$ c) $\frac{\pi}{10}$ d) $\frac{\pi}{5}$

6. The value of sum $\sum_{n=1}^{13}(i^n+i^{n+1})$, where $i=\sqrt{-1}$, equals

a) $-i$ b) $i-1$ c) $-i$ d) 0

7. If $x>0$ and $\log_3 x+\log_3(\sqrt{3})+\log_3(\sqrt[4]{x})+\log_3(\sqrt[8]{x})+\log_3(\sqrt[16]{x})+\ldots=4$, then x equals

a) 9 b) 81 c) 1 d) 27

8. Is S is the set of all real x such that $\frac{2x}{2x^2+5x+2}>\frac{1}{x+1}$, then S is equal to

a) $(-2, -1)$

b) $(-2/3, 0)$

c) $(-2/3, -1/2)$

d) $(-2, -1)\cup(-2/3, -1/2)$

9. The value of p for which the difference between the roots of the equation $x^2 + px + 8 = 0$ is 2 are

a) ± 2 b) ± 4 c) ± 6 d) ± 8

10. If $x^2 + ax + 10 = 0$ and $x^2 + bx - 10 = 0$ have a common root, then $a^2 - b^2$ is equal to

a) 10 b) 20 c) 30 d) 40

11. If $|z_1| = |z_2| = |z_3| = 1$ and z_1,z_2,z_3 represent the vertices of an equilateral triangle, then

a) $z_1 + z_2 + z_3 = 0$ and $z_1 z_2 z_3 = 1$

b) $z_1 + z_2 + z_3 = 1$ and $z_1 z_2 z_3 = 1$

c) $z_! z_2 + z_2 z_3 + z_3 z_1 = 0$ and $z_1 + z_2 + z_3 = 0$

d) $z_1 z_2 + z_2 z_3 + z_3 z_1 = 0$ and $z_1 z_2 z_3 = 1$

12. If $\sqrt{x + iy} = \pm (a + ib)$, then $\sqrt{-x - iy}$ is equal to

a) $\pm (b + ia)$ b) $\pm (a - ib)$ c) $\pm (b - ia)$ d) None of these

13. If the roots of the equation $x^2 + px + q = 0$ are α and β and roots of the equation $x^2 - xr + s = 0$ are α^4, β^4, then the roots of the equation $x^2 - 4qx + 2q^2 = 0$ are

a) Both negative b) Both positive

c) Both real d) One negative and one positive

14. If a, b,$c$are the sides of the triangle ABC such that $a \neq b \neq c$ and $x^2 - 2(a + b + c)x + 3\lambda(ab + bc + ca) = 0$ has real roots, then

a) $\lambda < \frac{4}{3}$ b) $\lambda > \frac{5}{3}$ c) $\lambda \in \left(\frac{4}{3}, \frac{5}{3}\right)$ d) $\lambda \in \left(\frac{1}{3}, \frac{5}{3}\right)$

15. The centre of a regular polygon of n sides is located at the point $z = 0$ and one of its vertex z_1 is known. If z_2 be the vertex adjacent to z_1, then z_2 is equal to

a) $z_1\left(\cos\frac{2\pi}{n} \pm i\sin\frac{2\pi}{n}\right)$ b) $z_1\left(\cos\frac{\pi}{n} \pm i\sin\frac{\pi}{n}\right)$

c) $z_1\left(\cos\frac{\pi}{2n} \pm i\sin\frac{\pi}{2n}\right)$ d) None of these

16. Let $z = \cos\theta + i\sin\theta$. Then, the value of $\sum_{m=1}^{15} \text{Im}(z^{2m-1})$ at $\theta = 2°$ is

a) $\frac{1}{\sin 2°}$ b) $\frac{1}{3\sin 2°}$ c) $\frac{1}{2\sin 2°}$ d) $\frac{1}{4\sin 2°}$

17. Let $a \in R$. If the origin and the non-real roots of $2z^2 + 2z + a = 0$ form the three vertices of an equilateral triangle in the argand plane, then $a =$

a) 1 b) 2 c) -1 d) None of these

18. The region of the Argand diagram defined by $|z - 1| + |z + 1| \leq 4$ is

a) Interior of an ellipse b) Exterior of a circle

c) Interior and boundary of an ellipse d) None of the above

19. The radius of the circle $\left|\frac{z - i}{z + i}\right| = 5$ is given by

a) $\frac{13}{12}$ b) $\frac{5}{12}$ c) 5 d) 625

20. The roots of the cubic equation $(z + \alpha\beta)^3 = \alpha^3, \alpha \neq 0$
a) Represent sides of an equilateral triangle
b) Represent the sides of an isosceles triangle
c) Represent the sides of a triangle whose one side is of length $\sqrt{3}\,\alpha$
d) None of these