DPP

DAILY PRACTICE PROBLEMS

CLASS : XIth
DATE :

Solutions

SUBJECT : MATHS
DPP NO. : 2

Topic :- COMPLEX NUMBERS AND QUADRATIC EQUATIONS

1. The number of integral solutions of $2(x+2) > x^2 + 1$, is

   a) 2 b) 3 c) 4 d) 5

2. If one root of the equation $(a-b)x^2 + ax + 1 = 0$ be double the other and if $a \in R$, then the greatest value of b is

   a) 9/8 b) 7/8 c) 8/9 d) 8/7

3. The argument of $(1 - i\sqrt{3})(1 + i\sqrt{3})$ is

   a) 60° b) 120° c) 210° d) 240°

4. If the area of the triangle on the complex plane formed by the points z, $z + iz$, and iz is 200, then the value of $|3z|$ must be equal to

   a) 20 b) 40 c) 60 d) 80

5. If the roots of the equation $bx^2 + cx + a = 0$ be imaginary, then for all real values of x, the expression $3b^2x^2 + 6bcx + 2c^2$ is

   a) Greater than $4ab$ b) Less than $4ab$ c) Greater than $-4ab$ d) Less than $-4ab$

6. If $(ax^2 + c)y + (d\,x^2 + c') = 0$ and x is a rational function of y and ac is negative, then

   a) $ac' + a'c = 0$ b) $\frac{a}{a'} = \frac{c}{c'}$ c) $a^2 + c^2 = a'^2 + c'^2$ d) $aa' + cc' = 1$

7. If n is a positive integer, then $(1 + i\sqrt{3})^n + (1 - i\sqrt{3})^n$ is equal to

   a) $2^{n-1}\cos\frac{n\pi}{3}$ b) $2^n\cos\frac{n\pi}{3}$ c) $2^{n+1}\cos\frac{n\pi}{3}$ d) None of these

8. The points represented by the complex numbers $1 + i,\ -2 + 3i, \frac{5}{3}i$ on the argand diagram are

   a) Vertices of an equilateral triangle b) Vertices of an isosceles triangle
   c) Collinear d) None of the above

9. If the amplitude of $z - 2 - 3i$ is $\frac{\pi}{4}$, then the locus of $z = x + iy$, is

   a) $x + y - 1 = 0$ b) $x - y - 1 = 0$ c) $x + y + 1 = 0$ d) $x - y + 1 = 0$

10. The value of $\frac{[(\cos 20° + i \sin 20°)(\cos 75° + i \sin 75°)(\cos 10° + i \sin 10°)]}{\sin 15° - i \cos 15°}$ is

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

11. Let α,β be the roots of $x^2 + bx + 1 = 0$. Then the equation whose roots are $-\left(\alpha + \frac{1}{\beta}\right)$ and $-\left(\beta + \frac{1}{\alpha}\right)$, is

a) $x^2 = 0$ b) $x^2 + 2b + 4 = 0$ c) $x^2 - 2bx + 4 = 0$ d) $x^2 - bx + 1 = 0$

12. The vector $z = -4 + 5i$ is turned counterclockwise through an angle of 180° and stretched $1\frac{1}{2}$ times. The complex number corresponding to newly obtained vector is

a) $6 - \frac{15}{2}i$ b) $-6 + \frac{15}{2}i$ c) $6 + \frac{15}{2}i$ d) None of these

13. If $(3 - i)z = (3 - i)\bar{z}$, then the complex number z is

a) $a(3 - i), a \in R$ b) $\frac{a}{(3 + i)}, a \in R$ c) $a(3 + i), a \in R$ d) $a(-3 + i), a \in R$

14. For real values of x, the expression $\frac{(x - b)(x - c)}{(x - a)}$ will assume all real values provided

a) $a \le c \le b$ b) $b \ge a \ge c$ c) $b \le c \le a$ d) $a \ge b \ge c$

15. If $(x - 1)^3$ is a factor of $x^4 + ax^3 + bx^2 + cx - 1$, then the other factor is

a) $x - 3$ b) $x + 1$ c) $x + 2$ d) $x - 1$

16. The centre of a square is at the origin and $1 + i$ is one of its vertices. The extremities of its diagonals which does not pass through this vertex are

a) $1 - i, -1 + i$ b) $1 - i, -1 - i$ c) $-1 + i, -1 - i$ d) None of these

17. If $p(x) = ax^2 + bx + c$ and $Q(x) = -ax^2 + dx + c$, where $ac \ne 0$, then $P(x)Q(x) = 0$ has at least

a) Four real roots b) Two real roots
c) Four imaginary roots d) None of these

18. If $a = \cos\theta + i\sin\theta$, then $\frac{1 + a}{1 - a}$ is equal to

a) $\cot\frac{\theta}{2}$ b) $\cot\theta$ c) $i\cot\frac{\theta}{2}$ d) $i\tan\frac{\theta}{2}$

19. If $x^2 + 2ax + b \ge c, \forall x \in R$, then

a) $a - c \ge a^2$ b) $c - a \ge b^2$ c) $a - b \ge c^2$ d) None of these

20. Let A,B,C be three collinear points which are such that $AB.AC = 1$ and the points are represented in the Argand plane by the complex numbers 0, z_1 and z_2 respectively, Then,

a) $z_1z_2 = 1$ b) $z_1\bar{z}_2 = 1$ c) $|z_1||z_2| = 1$ d) None of these