DPP

DAILY PRACTICE PROBLEMS

CLASS : XIth
DATE :

Solutions

SUBJECT : MATHS
DPP NO. : 6

Topic :- COMPLEX NUMBERS AND QUADRATIC EQUATIONS

1. If α and β be the roots of the equation $x^2 + x\sqrt{\alpha} + \beta = 0$, then
   a) $\alpha = 1$ and $\beta = -1$
   b) $\alpha = 1$ and $\beta = -2$
   c) $\alpha = 2$ and $\beta = 1$
   d) $\alpha = 2$ and $\beta = -2$

2. The number of real roots of the equation $(x-1)^2 + (x-2)^2 + (x-3)^2 = 0$ is
   a) 1 b) 2 c) 3 d) None of these

3. If $z(\neq -1)$ is a complex number such that $\frac{z-1}{z+1}$ is purely imaginary, then $|z| =$
   a) 1 b) 2 c) 3 d) 5

4. If z, z_2 and z_3 are any three complex numbers, then the fourth vertex of the parallelogram whose three vertices are z_1, z_2 and z_3 taken in order is
   a) $z_1 - z_2 + z_3$ b) $z_1 + z_2 + z_3$ c) $\frac{1}{3}(z_1 - z_2 + z_3)$ d) $\frac{1}{3}(z_1 + z_2 - z_3)$

5. If z is a complex number such that Re (z) = Im (z), then
   a) Re $(z^2) = 0$ b) Im $(z^2) = 0$ c) Re (z^2) = Im (z^2) d) Re $(z^2) = -$ Im (z^2)

6. $\sqrt{-1 - \sqrt{1 - \sqrt{1 - \ldots\infty}}}$ is equal to
   a) 1 b) -1 c) ω^2 d) $-\omega$

7. Let a be a complex number such that $|a| < 1$ and $z_1, z_2, \ldots$ be vertices of a polygon such that $z_k = 1 + a + a^2 + \ldots + a^{k-1}$. Then the vertices of the polygon lie within a circle is
   a) $|z - a| = a$
   b) $\left|z - \frac{1}{1-a}\right| = |1 - a|$
   c) $\left|z - \frac{1}{1-a}\right| = \frac{1}{|1-a|}$
   d) $|z - (1-a)| = |1 - a|$

8. If α, β, γ are the roots of the equation $x^3 - 7x + 7 = 0$, then $\frac{1}{\alpha^4} + \frac{1}{\beta^4} + \frac{1}{\gamma^4}$ is
   a) 7/3 b) 3/7 c) 4/7 d) 7/4

9. If $\sin\theta + \cos\theta = h$, then the quadratic equation having $\sin\theta$ and $\cos\theta$ as its roots, is
   a) $x^2 - hx + (h^2 - 1) = 0$
   b) $2x^2 - 2hx + (h^2 - 1) = 0$
   c) $x^2 - hx + 2(h^2 - 1) = 0$
   d) $x^2 - 2hx + (h^2 - 1) = 0$

10. If α *and* β are the roots of the equation $ax^2 + bx + c = 0, (c \neq 0)$, then the equation whose roots are $\frac{1}{a\alpha + b}$ and $\frac{1}{a\beta + b}$ is

a) $acx^2 - bx + 1 = 0$ b) $x^2 - acx + bc + 1 = 0$
c) $acx^2 + bx - 1 = 0$ d) $x^2 + acx - bc + 11 = 0$

11. The value of $\sqrt{i}$ is

a) $1 - i$ b) $1 + i$ c) $i - 1$ d) $\pm\frac{1}{\sqrt{2}}(1 + i)$

12. If one root of the quadratic equation $ax^2 + bx + c = 0$ is equal to nth power of the other root, then the value of $(ac^n)^{1/(n+1)} + (a^n c)^{1/(n+1)}$ is equal to

a) b b) $-b$ c) $\frac{1}{b^{n+1}}$ d) $-\frac{1}{b^{n+1}}$

13. The modulus of the complex number z such that $|z + 3 - i| = 1$ and $\arg(z) = \pi$ is equal to

a) 1 b) 2 c) 9 d) 3

14. The product of cube roots of -1 is equal to

a) -1 b) 0 c) -2 d) 4

15. If the roots of $x^3 - 3x^2 - 6x + 8 = 0$ are in arithmetic progression, then the roots of the equation are

a) 3, 4, 5 b) 4, 7, 10 c) -2, 1, 4 d) 1, 4, 7

16. The number of values of a for which $(a^2 - 3a + 2)x^2 + (a^2 - 5a + 6)x + a^2 - 4 = 0$ is an identity in x, is

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

17. If z_1, z_2, z_3 are vertices of an equilateral triangle inscribed in the circle $|z| = 2$ and if $z_1 = 1 + i\sqrt{3}$, then

a) $z_1 = -2, z_3 = 1 - i\sqrt{3}$
b) $z_2 = 2, z_3 = 1 - i\sqrt{3}$
c) $z_2 = -2, z_3 = -1 - i\sqrt{3}$
d) $z_2 = 1 - i\sqrt{3}, z_3 = -1 - i\sqrt{3}$

18. The solution set of the inequation $\frac{x^2 - 3x + 4}{x + 1} >, x \in R$, is

a) $(3, \infty)$ b) $(-1, 1) \cup (3, \infty)$ c) $[-1, 1] \cup [3, \infty)$ d) None of these

19. The number of real solutions of the equation $\left(\frac{9}{10}\right)^x = -3 + x - x^2$ is

a) None b) One c) Two d) More than two

20. The quadratic equation whose roots are three times the roots of $3ax^2 + 3bx + c = 0$ is

a) $ax^2 + 3bx + 3c = 0$ b) $ax^2 + 3bx + c = 0$ c) $9ax^2 + 9bx + c = 0$ d) $ax^2 + bx + 3c = 0$