DPP
DAILY PRACTICE PROBLEMS

CLASS : XIth
DATE :

Solutions

SUBJECT : MATHS
DPP NO. : 10

Topic :- COMPLEX NUMBERS AND QUADRATIC EQUATIONS

1. If α is a root of the equation $2x(2x+1)=1$, then the other roots is
   a) $3\alpha^3-4\alpha$ b) $-2\alpha(\alpha+1)$ c) $4\alpha^3-3\alpha$ d) None of these

2. If the roots of the equation $x^2-bx+c=0$ be two consecutive integers, then b^2-4c equals
   a) 1 b) 2 c) 3 d) -2

3. If x, y, z are in GP and $a^x=b^y=c^z$, then
   a) $\log_a c=\log_b a$ b) $\log_b a=\log_c b$ c) $\log_c b=\log_a c$ d) None of the above

4. If the complex numbers $z_1=a+i, z_2=1++ib, z_3=0$ form the vertices of equilateral triangle (a, b are real numbers between 0 and 1), then
   a) $a=\sqrt{3}-1, b=\frac{\sqrt{3}}{2}$
   b) $a=2-\sqrt{3}, b=2-\sqrt{3}$
   c) $a=1/2, b=3/4$
   d) None of these

5. Sum of the series $\sum_{r=0}^{n}(-1)^r\,{}^nC_r\{i^{5r}+i^{6r}+i^{7r}+i^{8r}\}$, is
   a) 2^n b) $2^{n/2+1}$ c) $n^n+2^{n/2+1}$ d) $2^n+2^{n/2+1}\cos\frac{n\pi}{4}$

6. If a, b and c are distinct positive real numbers in AP, then the roots of the equation $ax^2+2bx+c=0$ are
   a) Imaginary b) Rational and equal c) Rational and distinct d) Irrational

7. Let $z(\neq 2)$ be a complex number such that $\log_{1/2}|z-2|>\log_{1/2}|z|$, then
   a) Re $(z)>1$ b) Im $(z)>1$ c) Re $(z)=1$ d) Im $(z)=1$

8. The equation $z^5+z^4+z^3+z^2+z+1=0$ is satisfied by
   a) $z=\pm 1$ b) $z=-1$ c) $z=\pm\frac{1}{2}+\frac{i\sqrt{3}}{2}$ d) None of the above

9. The equation $x^2-3|x|+2=0$ has
   a) No real root b) One real root c) Two real roots d) Four real roots

10. If one root of the equation $x^2 + px + 12 = 0$ is 4, while the equation $x^2 + px + q = 0$ has equal roots, then the value of q is

a) 4 b) 12 c) 3 d) $\frac{49}{4}$

11. If $[x]^2 = [x + 2]$, where $[x] =$ the greatest integer less than or equal to x,then x must be such that

a) $x = 2, -1$ b) $[-1, 0] \cup [2, 3]$ c) $x \in [-1, 0]$ d) None of these

12. If α,β are the roots of $ax^2 + bx + c = 0$ the equation whose roots are $2 + \alpha, 2 + \beta$ is

a) $ax^2 + x(4a - b) + 4a - 2b + c = 0$
b) $ax^2 + x(4a - b) + 4a + 2b + c = 0$
c) $ax^2 + x(b - 4a) + 4a + 2b + c = 0$
d) $ax^2 + x(b - 4a) + 4a - 2b + c = 0$

13. If α,β and γ are angles such that $\tan\alpha + \tan\beta + \tan\gamma = \tan\alpha \tan\beta \tan\gamma$ and $x = \cos\alpha + i\sin\alpha$, $y = \cos\beta + i\sin\beta$ and $z = \cos\gamma + i\sin\gamma$, then xyz is equal to

a) 1, but not -1 b) -1, but not 1 c) +1 or -1 d) 0

14. If $\arg(z_1 z_2) = 0$ and $|z_1| = |z_2| = 1$, then

a) $z_1 + z_2 = 0$ b) $z_1\overline{z_2} = 1$ c) $z_1 = \overline{z_2}$ d) None of these

15. If the equation $2x^2 - 7x + 1 = 0$ and $ax^2 + bx + 2 = 0$ have a common root, then

a) $a = 2, b = -7$ b) $a = -\frac{7}{2}, b = 1$ c) $a = 4, b = -14$ d) None of these

16. The polynomial $x^{3m} + x^{3n+1} + x^{3k+2}$ is exactly divisible by $x^2 + x + 1$ if

a) m,n,k are rational
b) m,n,k are integers
c) m,n,k are positive integers
d) None of these

17. If $a, b, c \neq 0$ and belongs to the set {0, 1,2, 3, ……., 9},
Then $\log_{10}\left(\frac{a + 10b + 10^2c}{10^{-4}a + 10^{-3}b + 10^{-2}c}\right)$ is equal to

a) 1 b) 2 c) 3 d) 4

18. If the roots of the equation $x^2 + px + q = 0$ are $\tan 30°$ and $\tan 15°$ respectively, then the value of $2 + q - p$ is

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

19. If $z = x - iy$ and $z^{1/3} = p + iq$, then $\left(\frac{x}{p} + \frac{y}{q}\right)/(p^2 + q^2)$ is equal to

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

20. If $\sec\alpha$ and $\operatorname{cosec}\alpha$ are the roots of the equation $x^2 - px + q = 0$, then

a) $p^2 = p + 2q$ b) $q^2 = p + 2q$ c) $p^2 = q(q + 2)$ d) $q^2 = p(p + 2)$