

India's Number 1 Education App

MATHS

BOOKS - RESONANCE DPP ENGLISH

COMPLEX NUMBERS AND QUADRATIC EQUATIONS

Others

1. If a, b c are real numbers satisfying the condition a+b+c=0 then the roots of the quadratic equation $3ax^2+5bx+7c=0$ are



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2. Find the value of 'k' for which the following set of quadratic equations

has exactly one common root,

 $x^2 - kx + 10 = 0$ and $x^2 + kx - 18 = 0$.

3. The least integral value of $\,'a'$ for which the graphs y=2ax+1 and $y=(a-6)x^2-2$ do not intersect: (a) -6 (b) -5 (c) 3 (d) 2



4. If $lpha,\!eta\gamma$ are the roots of the equation $x^3+px^2+qx+r=0$, then $ig(1-lpha^2ig)ig(1-eta^2ig)ig(1-\gamma^2ig)$ is equal to

(a)
$$(1+q)^2-(p+r)^2$$
 (b) $(1+q)^2+(p+r)^2$

(c) $(1-q)^2 + (p-r)^2$ (d) none of these

5. if (x-a)(x-5)+2=0 has only integral roots where $a\in I,\,$ then



value of a can be: a. 8 b. 7 c. 6 d. 5

6. If α , $\beta\gamma$ are the real roots of the equation $x^3-3px^2+3qx-1=0$, then find the centroid of the triangle whose vertices are $\left(\alpha,\frac{1}{\alpha}\right),\left(\beta,\frac{1}{\beta}\right)$ and $\left(\gamma,\frac{1}{\gamma}\right)$.



7. Find all values of p for which the roots of the equation $(p-3)x^2-2px+5p=0$ are real and positive



8. If z_1,z_2,z_3 are distinct nonzero complex numbers and $a,b,c\in R^+$ such that $\dfrac{a}{|z_1-z_2|}=\dfrac{b}{|z_2-z_3|}=\dfrac{c}{|z_3-z_1|}$ Then find the value of $\dfrac{a^2}{|z_1-z_2|}+\dfrac{b^2}{|z_2-z_3|}+\dfrac{c^2}{|z_3-z_1|}$



9. Let z be a complex number satisfying

$$|z-1| \leq |z-3|, |z-3| \leq |z-5|, |z+i| \leq |z-i|$$
 and

 $|z-i| \leq |z-5i|$. Then the area of region in which z lies is A square



units, where A



10. If $a^3+b^3+6abc=8c^3\&\omega$ is a cube root of unity then: (a)a,b,c are in A.P. (b) a,b,c, are in H.P. (c) $a+b\omega-2c\omega^2=0$ (d) $a+b\omega^2-2c\omega=0$



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11. The image of a complex number z in the imaginary axis is (A) z (B) iz

(C)
$$-z$$
 (D) $-iz$



12. If z_1,z_2,z_3 are the vertices of the ABC on the complex plane and are also the roots of the equation $z^3-3az^2+3\beta z+\gamma=0$ then the condition for the ABC to be equilateral triangle is: $\alpha^2=\beta$ (b) $\alpha=\beta^2$



 $lpha^2=3eta$ (d) $lpha=3eta^2$

13. If
$$2x=-1+\sqrt{3}i,$$
 then the value of $\left(1-x^2+x\right)^6-\left(1-x+x^2\right)^6$ is 32 (b) -64 (c) 64 (d) 0



14. if
$$iz^3+z^2-z+i=0$$
 , then show that $|\mathbf{z}|$ =1.



15. Number of roots which are common to the equations $x^3+2x^2+2x+1=0$ and $x^{2008}+x^{2009}+1=0$, are (A) O (B) 1 (C) 2

(D) 3

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16. If z_1,z_2,z_3,z_4 be the vertices of a parallelogram taken in anticlockwise direction and $|z_1-z_2|=|z_1-z_4|,$ then

$$\sum_{r=1}^4 \left(\,-1
ight)^r z_r = 0$$
 (b) $z_1 + z_2 - z_3 - z_4 = 0$ $arrac{g(z_4 - z_2)}{z_3 - z_1} = rac{\pi}{2}$ (d)

None of these



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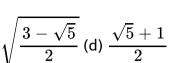
17. about to only mathematics



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18. The greatest value of the modulus of the complex number $^{\prime}z^{\prime}$

satisfying the equality
$$\left|z+\frac{1}{z}\right|=1$$
 is: $\frac{-1+\sqrt{5}}{2}$ (b) $\sqrt{\frac{3+\sqrt{5}}{2}}$





19. The set of points in an Argand diagram which satisfy both $|z| \leq 4$ and $0 \leq arg(z) \leq \frac{\pi}{3}$, is



- **20.** The number of solutions of $z^3 + z = 0$ is (a) 2 (b) 3 (c) 4 (d) 5
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21. If ω is an imaginary cube root of unity, then the value of

$$\left(p+q
ight)^3+\left(p\omega+q\omega^2
ight)^3+\left(p\omega^2+q\omega
ight)^3$$
 is:

$$(a)3(p+q)(p+q\omega)ig(p+q\omega^2ig)$$
 (b) $3ig(p^3+q^3ig)$ (c)

$$3ig(p^3+q^3ig)-pq(p+q)$$
 (d) $3ig(p^3+q^3ig)pq(p+q)$



22. If z_0,z_1 represent points P,Q on the locus |z-1|=1 and the line segment PQ subtends an angle $\frac{\pi}{2}$ at the point z=1 then z_1 is equal to (a) $1+i(z_0-1)$ (b) $\frac{i}{z_0-1}$ (c) $1-i(z_0-1)$ (d) $i(z_0-1)$



23. If $z_1=a+ib$ and $z_2=c+id$ are two complex numbers where a,b,c,d \in R and $|z_1|=|z_2|=1$ and Im $(z_1ar z_2)=0$. If $w_1=a+ic$ and $w_2=b+id$, then :



24. The centre of a square is at the point with complex number $z_0=1+i$ and one of its vertices is at the points $z_1=1-i$. The complex numbers which correspond to the other vertices are (a)– 1+i(b) 1 + 3i (c) 3 + i (d) 3 - i



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25. Intercept made by the circle zz + a + az + r = 0 on the real axis complex plane is $\sqrt{(a+a)-r}$ b. $\sqrt{(a+a)^2-r}$ c. $\sqrt{\left(a+a
ight)^2-4r}$ d. $\sqrt{\left(a+a
ight)^2-4r}$



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26. The triangle formed by the complex numbers z, iz, i^2z is:



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27. The $\omega \neq 1$ is nth root unity, then value of $\sum_{k=0}^{n-1}\left|z_1+\omega^kz_2\right|^2$ is $n\Big(|z_1|^2+|z_2|^2\Big)$ b. $|z_1|^2+|z_2|^2$ c. $(|z_1|+|z_2|)^2$ d. $n(|z_1|+|z_2|)^2$



28. If product of the roots of the equation $3x^2-4x+\left(\log a^2-\log(-a)+3\right)=0$ is 1, then 'a' equal to a. not possible b. -1 c. 1 d. none of these



29. The reflection of the complex number $\frac{2-i}{3+i}$, (where $i=\sqrt{-1}$ in the straight line $z(1+i)=\bar{z}(i-1)$ is $\frac{-1-i}{2}$ (b) $\frac{-1+i}{2}$ $\frac{i(i+1)}{2}$ (d) $\frac{-1}{1+i}$



30. If 0 < a < b < c and the roots lpha, eta of equation $ax^2 + bx + c = 0$

are imaginary, then |lpha|=|eta| (b)|lpha|>1 |eta|<1 (d) None of these



31. A,B and C are the points respectively the complex numbers z_1, z_2 and z_3 respectivley, on the complex plane and the circumcentre of \triangle ABC lies at the origin. If the altitude of the triangle through the vertex. A meets the circumcircle again at P, prove that P represents the complex number $\left(-\frac{z_2z_3}{z_1}\right)$.



32.
$$\left(\frac{-1+i\sqrt{3}}{2} \right)^6 + \left(\frac{-1-i\sqrt{3}}{2} \right)^6 + \left(\frac{-1+i\sqrt{3}}{2} \right)^5 + \left(\frac{-1-i\sqrt{3}}{2} \right)^5$$

is equal to

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33. The statement (a+ib)<(c+id) is true for $a^2+b^2=0$ (b) $b^2+d^2=0\,b^2+c^2=0$ (d) None of these



34. If lpha and eta are the roots of the equation x^2 -x+1=0 , then $lpha^{2009}+eta^{2009}=$ (1) 4 (2) 3 (3) 2 (4) 1



35. If α,β and γ are the cube roots of P(p)<0, then for any $x,y, \ {\rm and} \ z, \frac{x\alpha+y\beta+z\gamma}{x\beta+y\gamma+z\alpha}$ is equal to



36. If $z_1,\,z_2,\,z_3,\,z_4$ are imaginary 5th roots of unity, then the value of

$$\sum_{i=1}^{16} ig(z1r+z2r+z3r+z4rig), is$$
 O (b) -1 (c) 20 (d) 19

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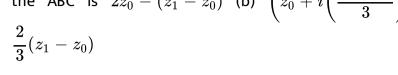
37. If z and w are two complex number such that |zw|=1 and $arg(z)-arg(w)=rac{\pi}{2}$, then show that $ar{z}w=-i$



38. If $z \neq 0$ be a complex number and $arg(z)=\frac{\pi}{4}$, then $Re(z)=Im(z)only~Re(z)=Im(z)>0~Reig(z^2ig)=Imig(z^2ig)$ (d) None of these



39. The centre of a square ABCD is at z_0 . If A is z_1 , then the centroid of the ABC is $2z_0-(z_1-z_0)$ (b) $\left(z_0+i\left(\frac{z_1-z_0}{3}\right)\ \frac{z_0+iz_1}{3}\right)$ (d)





40. The continued product of all values of $(\cos\alpha+i\sin\alpha)^{\frac{3}{5}}$ is 1 (b) $\cos\alpha+i\sin\alpha\cos3\alpha+i\sin3\alpha$ (d) $\cos5\alpha+i\sin5\alpha$



41. The number of 15th roots of unity which are also the 25th root of unity is: 3 (b) 5 (c) 10 (d) None of these

