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MATHEMATICS · EAPCET (EAMCET)

Complex Numbers

Previous Year Questions with answers

518 questions · **149** papers · **2010–2026** · newest paper first

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What is in this PDF: every Complex Numbers question we hold from past AP and TS EAPCET (called EAMCET until 2020 in Andhra Pradesh and 2023 in Telangana) papers, with its options and answer. Where an answer comes from a source other than the official final key, it says so next to the answer.

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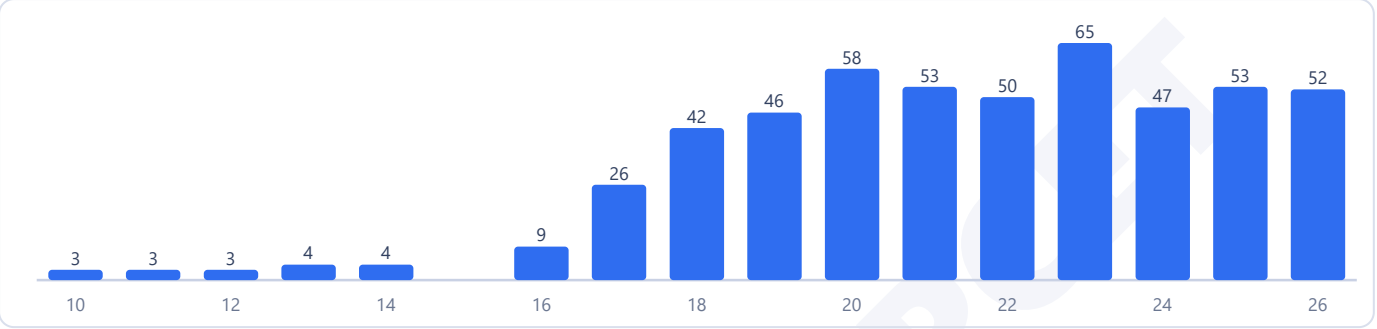
Chapter at a glance

4.3%	518	77 of 77	518 / 0
of Mathematics questions, 2022–2026	questions, 2010–2026	papers asked it, 2022–2026	MCQ / numerical, 2010–2026

Trend. Steady: 3.3 questions per paper in 2024–2026 against 3.7 in 2022–2023.

Questions per year



Counts are the questions we hold: 518 in 149 papers. 4 questions in this chapter came back in more than one paper.

Most-asked topics in this chapter (2010–2026)

De Moivre's Theorem & Roots of Unity	213
Algebra of Complex Numbers	167
Geometry of Complex Numbers	138

How often it comes up

Complex Numbers commands a heavy presence across every iteration of the EAPCET examination. Over the aggregate historical window spanning 2010 through 2026, the chapter accounted for 518 questions across 149 evaluated exam papers, appearing in all 149 papers to maintain an average of 3.5 questions per paper and a 4.3 percent subject share. In contemporary papers from 2022 to 2026, Complex Numbers preserved this unbroken appearance across all 77 sittings, yielding 267 questions (averaging 3.5 questions per paper and a 4.3 percent subject share). This places Complex Numbers at rank 10 among the 29 mathematics chapters.

Every paper in the modern period incorporates between three and four questions from this topic. In the three most recent exam cycles between 2024 and 2026, question setters included 152 questions across 46 sittings (featuring in every single paper, averaging 3.3 questions per test and a 4.1 percent share). In the previous examination span from 2010 to 2021, the chapter provided 251 questions across 72 papers (present in all 72, averaging 3.5 per test and a 4.4 percent share). Looking across longitudinal splits, comparing early testing with the last three years shows the share is about the same, and comparing recent testing with the last three years also shows the share is about the same. Across the two regional boards from 2022 to 2026, Andhra Pradesh contributed 153 questions across 48 papers (all 48 papers, 3.2 per test, 4.0 percent share), while Telangana administered 114 questions across 29 papers (all 29 papers, 3.9 per test, 4.9 percent share).

Most-asked topics

The chapter divides into three core mathematical areas:

- **De Moivre's Theorem & Roots of Unity**: Contributing 213 questions across the entire dataset, with 106 in recent papers (tested up to 2026). Major themes include integer and fractional powers via De Moivre formula, properties of the cube roots of unity (one plus omega plus omega squared equals zero, omega cubed equals one), product expansions of roots of unity, and solving binomial or cyclotomic equations.

- **Algebra of Complex Numbers**: Generating 167 total questions, with 93 emerging in modern testing (last asked in 2026). Core concepts encompass rectangular to polar and Euler transformations, square roots of complex numbers, conjugates, moduli, arguments, and power evaluations.
- **Geometry of Complex Numbers**: Registering 138 total questions, with 68 appearing in recent years (last set in 2026). Questions test straight lines and circles in the complex plane, perpendicular bisector loci from modulus ratios, equilateral triangles on the Argand plane, and region-bounding inequalities.

What the questions look like

Examiners test analytical transformations and geometric interpretation on the Argand plane.

A very frequent problem presents a high integer exponent of an algebraic fraction involving trigonometric or radical terms. Students convert the base into polar or Euler form, simplify using exponential rules, and apply De Moivre formula to identify the quadrant or evaluate the real part. Another recurring pattern requires finding the locus of points satisfying an equation where the ratio of two shifted complex moduli equals a constant: when the constant equals one, the locus is a perpendicular bisector, whereas when it differs from one, it traces an Apollonius circle. Problems on cube roots of unity routinely ask for the numerical value of symmetric polynomials by repeatedly reducing powers modulo three.

How to practise it

Begin by consolidating algebraic fundamentals: master finding the square root of a complex number algebraically and calculating the principal argument across all four quadrants. Memorize the algebraic identities for cube roots of unity, particularly how one plus omega plus omega squared vanishes and how higher exponents collapse through periodicity of three.

Next, develop speed with geometric interpretations. Recognize that the equation modulus of z minus z one equals modulus of z minus z two describes the perpendicular bisector of the segment joining those points. Ensure you can identify the center and radius of circles written in complex notation, such as z times z-conjugate plus alpha times z-conjugate plus alpha-conjugate times z plus real constant equals zero. Finally, practice converting rational trigonometric fractions into cis theta form using half-angle formulas to streamline De Moivre computations.

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Q1 AP EAPCET 2026 · 18 May · Shift 1 MCQ

Let a point P in the Argand plane represent the complex number z. If $Arg\left(\frac{2z-i}{z-2}\right)=\frac{\pi}{4}$, then the locus of P is

(A) $4x^2-2xy+2y^2+6x-5y+2=0$
(B) $2x^2+2y^2-3x+3y-2=0$
(C) $x^2+2y^2-3x+2y-2=0$
(D) $2x^2+xy+2y^2-3x-y-2=0$

Answer: (B) $2x^2+2y^2-3x+3y-2=0$ · The council's preliminary key

Q2 AP EAPCET 2026 · 18 May · Shift 1 MCQ

One of the values of the square root of $\left(\frac{1}{2}+\frac{\sqrt{3}\,i}{2}\right)$

(A) $\frac{\sqrt{3}}{2}-\frac{i}{2}$
(B) $\frac{1}{2}-\frac{\sqrt{3}\,i}{2}$
(C) $-\frac{\sqrt{3}}{2}+\frac{i}{2}$
(D) $-\frac{\sqrt{3}}{2}-\frac{i}{2}$

Answer: (D) $-\frac{\sqrt{3}}{2}-\frac{i}{2}$ · The council's preliminary key

Q3 AP EAPCET 2026 · 18 May · Shift 1 MCQ

If $1, i \in C$, the set of complex numbers, then the value of $\sqrt{1}+\sqrt{i}$ cannot be

(A) $\frac{\sqrt{2}+1+i}{\sqrt{2}}$
(B) $\frac{\sqrt{2}+1-i}{\sqrt{2}}$
(C) $\frac{\sqrt{2}-1-i}{\sqrt{2}}$
(D) $\frac{-\sqrt{2}-1-i}{\sqrt{2}}$

Answer: (B) $\frac{\sqrt{2}+1-i}{\sqrt{2}}$ · The council's preliminary key

Q4 AP EAPCET 2026 · 18 May · Shift 2 MCQ

If $z_1=x+iy$, $z_2=a+ib$ and $x^2+y^2=a^2+b^2$, then $z_2=$

(A) $|z_1|\,cis\left(\mathrm{Tan}^{-1}\left(\frac{b}{a}\right)\right)$
(B) $|\overline{z_2}|\,z_1$
(C) $z_1\,cis\left(\mathrm{Tan}^{-1}\left(\frac{y}{x}\right)\right)$
(D) z_1

Answer: (A) $|z_1|\,cis\left(\mathrm{Tan}^{-1}\left(\frac{b}{a}\right)\right)$ · The council's preliminary key

Q5 AP EAPCET 2026 · 18 May · Shift 2 MCQ

The locus of $|z-2i|+|z+4i|=10$ is

(A) a circle with centre at $(0, -1)$ and radius 5
(B) a parabola with focus at $(0, -1)$
(C) a hyperbola with foci at $(0, 2)$ and $(0, -4)$
(D) an ellipse with eccentricity $3/5$

Answer: (D) an ellipse with eccentricity $3/5$ · The council's preliminary key

Q6 AP EAPCET 2026 · 18 May · Shift 2 MCQ

If $z = (1 + 3i)^{4/3}$, then product of all the values of z is

(A) $28 - 96i$
(B) $28 + 96i$
(C) $\frac{7 + 24i}{100}$
(D) $\frac{7 - 24i}{100}$

Answer: (A) $28 - 96i$ · The council's preliminary key

Q7 AP EAPCET 2026 · 15 May · Shift 1 MCQ

If $\text{Arg}\left(\frac{z-1}{z+5}\right) = \pi/3$ and $|z - 1| = |z + 5|$, then $|z|^2 =$

(A) 36
(B) 31
(C) 41
(D) 39

Answer: (B) 31 · The council's preliminary key

Q8 AP EAPCET 2026 · 15 May · Shift 1 MCQ

Among the solutions of the equation $x^6 = 64$, the sum of all those solutions whose real part is negative is

(A) 0
(B) -2
(C) -4
(D) -3

Answer: (C) -4 · The council's preliminary key

Q9 AP EAPCET 2026 · 15 May · Shift 1 MCQ

The modulus of the product of all the values of $(2 + 3i)^{(3/5)}$ is

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(A) $\sqrt{2197}$
(B) $\sqrt{2245}$
(C) $\sqrt{135}$
(D) $\sqrt{489}$

Answer: (A) $\sqrt{2197}$ · The council's preliminary key

Q10 AP EAPCET 2026 · 15 May · Shift 2 MCQ

If the complex conjugate of $\frac{(1-i)^3}{(\sqrt{3}-i)^2}$ is $x+iy$, then $y-x=$

(A) 1
(B) $\frac{1}{2}$
(C) $2\sqrt{3}$
(D) $\frac{2}{\sqrt{3}}$

Answer: (B) $\frac{1}{2}$ · The council's preliminary key

Q11 AP EAPCET 2026 · 15 May · Shift 2 MCQ

Let $P(x,y)$ represent a complex number 'z' in the Argand plane and $\left|\frac{z-(2+i)}{z+(2-i)}\right|=2$. If the locus of P is a circle S, then the centre of S is

(A) $(-10,3)$
(B) $(-20,6)$
(C) $(10,-3)$
(D) $\left(-\frac{10}{3},1\right)$

Answer: (D) $\left(-\frac{10}{3},1\right)$ · The council's preliminary key

Q12 AP EAPCET 2026 · 14 May · Shift 1 MCQ

Among the roots of $3\sqrt{3}\,z^3-i=0$, the sum of the squares of the two roots having non-zero real part is

(A) ω^2
(B) $\frac{2}{3}$
(C) ω
(D) $\frac{1}{3}$

Answer: (D) $\frac{1}{3}$ · The council's preliminary key

Q13 AP EAPCET 2026 · 14 May · Shift 1 MCQ

If $z_1 = 1 + i,\ z_2 = -1 - i$ represent two fixed points on the Argand plane, then the solution of $|z - z_1| = |z - z_2|$ is

(A) $z = 0$ only

(B) $z = 2x - ix\ (x \in \mathbb{R})$

(C) $z = x - ix\ (x \in \mathbb{R})$

(D) $z = y + iy\ (y \in \mathbb{R})$

Answer: (C) $z = x - ix\ (x \in \mathbb{R})$ · The council's preliminary key

Q14 AP EAPCET 2026 · 14 May · Shift 1 MCQ

Given that $\sum_{k=1}^{n} k(k-1) = \frac{n(n-1)(n+1)}{3}$ and

ω and ω^2 are complex cube roots of unity

If $\sum_{k=1}^{2026} \left(k + \frac{1}{\omega}\right)\left(k + \frac{1}{\omega^2}\right) = \frac{2026}{3}(N + 3)$, then $N =$

(A) 2025×2026

(B) 2025×2024

(C) 2027×2025

(D) 2026×2027

Answer: (C) 2027×2025 · The council's preliminary key

Q15 AP EAPCET 2026 · 14 May · Shift 2 MCQ

If $z_1 = 8 + 4i$, $z_2 = 6 + 4i$ and $Arg\left(\frac{z - z_1}{z - z_2}\right) = \frac{\pi}{4}$, then 'z' satisfies

(A) $|z - 7 - 4i| = 1$

(B) $|z - 7 - 5i| = \sqrt{2}$

(C) $|z - 4i| = 8$

(D) $|z - 1 - 7i| = \sqrt{18}$

Answer: (B) $|z - 7 - 5i| = \sqrt{2}$ · The council's preliminary key

Q16 AP EAPCET 2026 · 14 May · Shift 2 MCQ

If the point P represents a complex number 'z' in the Argand diagram and $\frac{z-i}{z-1}$ is always purely imaginary, then the locus of 'P' is

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(A) Circle with centre $\left(\frac{1}{2}, \frac{1}{2}\right)$ and radius $\frac{1}{\sqrt{2}}$

(B) Circle with centre $\left(-\frac{1}{2}, -\frac{1}{2}\right)$ and radius $\frac{1}{\sqrt{2}}$

(C) Circle with centre $\left(\frac{1}{2}, \frac{1}{2}\right)$ and radius $\frac{1}{\sqrt{2}}$ except the points $(0,1)$ and $(1,0)$

(D) Circle with centre $\left(-\frac{1}{2}, -\frac{1}{2}\right)$ and radius $\frac{1}{2}$ except the point $(1,0)$

Answer: (C) Circle with centre $\left(\frac{1}{2}, \frac{1}{2}\right)$ and radius $\frac{1}{\sqrt{2}}$ except the points $(0,1)$ and $(1,0)$ · Checked by our team

Q17 AP EAPCET 2026 · 14 May · Shift 2 MCQ

The solutions of the equation $2\sqrt{2}x^4 = (\sqrt{3}-1) + i(\sqrt{3}+1)$ are

(A) $x = \pm\, cis\, \frac{3\pi}{38}, \pm\, cis\, \frac{23\pi}{38}$

(B) $x = \pm\, cis\, \frac{5\pi}{48}, \pm\, cis\, \frac{29\pi}{48}$

(C) $x = \pm\, cis\, \frac{7\pi}{48}, \pm\, cis\, \frac{41\pi}{48}$

(D) $x = \pm\, cis\, \frac{9\pi}{62}, \pm\, cis\, \frac{27\pi}{62}$

Answer: (B) $x = \pm\, cis\, \frac{5\pi}{48}, \pm\, cis\, \frac{29\pi}{48}$ · The council's preliminary key

Q18 AP EAPCET 2026 · 13 May · Shift 1 MCQ

If $\frac{3}{2+\cos\theta + i\sin\theta} = x + iy$, then $(x-1)(x-3) =$

(A) y^2

(B) $-y^2$

(C) 0

(D) 1

Answer: (B) $-y^2$ · The council's preliminary key

Q19 AP EAPCET 2026 · 13 May · Shift 1 MCQ

If z_1, z_2 are two roots of the equation $z^2 + az + b = 0$ and on the Argand plane points represented by z_1, z_2 and origin forms an equilateral triangle, then $a^2 =$

(A) b

(B) $2b$

(C) $3b$

(D) $4b$

Answer: (C) $3b$ · The council's preliminary key

Q20 AP EAPCET 2026 · 13 May · Shift 1 MCQ

If $(1+\sin\alpha + i\cos\alpha)^8 = A(\cos\theta + i\sin\theta)$, then A and θ are respectively

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(A) $2^8\cos^8\left(\frac{\pi}{4}-\frac{\alpha}{2}\right), 2\alpha$
(B) $2^8\cos^8\left(\frac{\pi}{4}-\frac{\alpha}{2}\right), -4\alpha$
(C) $2^8\cos^8\left(\frac{\pi}{4}+\frac{\alpha}{2}\right), 2\alpha$
(D) $2^8\cos^8\left(\frac{\pi}{4}+\frac{\alpha}{2}\right), -4\alpha$

Answer: (B) $2^8\cos^8\left(\frac{\pi}{4}-\frac{\alpha}{2}\right), -4\alpha$ · The council's preliminary key

Q21 AP EAPCET 2026 · 13 May · Shift 2 MCQ

If $x = 2-\sqrt{3}\,i$, then $x^4-8x^3+16x^2+1 =$

(A) 14
(B) $3x-26$
(C) $5x+32$
(D) 50

Answer: (D) 50 · The council's preliminary key

Q22 AP EAPCET 2026 · 13 May · Shift 2 MCQ

The locus of a point P representing a complex number 'z' in Argand plane such that $Re\left(\frac{z-2}{3z+2i}\right)=1$ is

(A) an ellipse with centre at $\left(-\frac{1}{2},-\frac{5}{6}\right)$
(B) an ellipse with a vertex at $\left(0,-\frac{2}{3}\right)$
(C) a circle with centre at $\left(0,-\frac{2}{3}\right)$
(D) a circle with centre at $\left(-\frac{1}{2},-\frac{5}{6}\right)$

Answer: (D) a circle with centre at $\left(-\frac{1}{2},-\frac{5}{6}\right)$ · The council's preliminary key

Q23 AP EAPCET 2026 · 13 May · Shift 2 MCQ

If α,β are the roots of the equation $x^2-2\sqrt{3}x+4=0$ and $0<Arg(\alpha)<\frac{\pi}{2}$, then $\alpha^{2026}-\beta^{2026} =$

(A) $2^{2027}(\sqrt{3}\,i)$
(B) $2^{2027}\,i$
(C) $-2^{2026}\,i$
(D) $-2^{2026}(\sqrt{3}\,i)$

Answer: (D) $-2^{2026}(\sqrt{3}\,i)$ · The council's preliminary key

Q24 AP EAPCET 2026 · 12 May · Shift 1 MCQ

A point P represents a complex number z in the Argand diagram.

If $\omega=\dfrac{z}{\left(z-\frac{1}{3}i\right)}$ and $|\omega|=1$, then the point P lies on

(A) An ellipse
(B) A circle
(C) A Parabola
(D) A straight line

Answer: (D) A straight line · The council's preliminary key

Q25 AP EAPCET 2026 · 12 May · Shift 1 MCQ

A, B represent the complex numbers z_1, z_2 in the complex plane. If O is the origin not lying on AB, $\angle AOB = \alpha$, $OA = OB$ and z_1, z_2 are the roots of the equation $z^2 + pz + q = 0$, where $p, q \in \mathbb{C}$, then $p^2 =$

(A) $4q\cos^2\left(\frac{\alpha}{2}\right)$
(B) $4q^2\cos\left(\frac{\alpha}{2}\right)$
(C) $4q\sin^2\left(\frac{\alpha}{2}\right)$
(D) $4q^2\sin\left(\frac{\alpha}{2}\right)$

Answer: (A) $4q\cos^2\left(\frac{\alpha}{2}\right)$ · The council's preliminary key

Q26 AP EAPCET 2026 · 12 May · Shift 2 MCQ

If $x = \omega^2 - \omega - 3$, ω being the non-real cube root of unity, then $x^4 + 6x^3 + 10x^2 - 12x - 19 =$

(A) -19
(B) 5
(C) 12
(D) -14

Answer: (B) 5 · Checked by our team

Q27 AP EAPCET 2026 · 12 May · Shift 2 MCQ

If $z_1 = \sqrt{3} + i\sqrt{3}$ and $z_2 = \sqrt{3} + i$, then the complex number $\left(\frac{z_1}{z_2}\right)^{50}$ lies in the

(A) First quadrant
(B) Second quadrant
(C) Third quadrant
(D) Fourth quadrant

Answer: (A) First quadrant · The council's preliminary key

Q28 AP EAPCET 2026 · 12 May · Shift 2 MCQ

$$\left[\frac{\sin\frac{2\pi}{9} + i\cos\frac{2\pi}{9} + 1}{\sin\frac{2\pi}{9} - i\cos\frac{2\pi}{9} + 1}\right]^3 =$$

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(A) $\frac{1}{2}(\sqrt{3}-i)$
(B) $-\frac{1}{2}(1-i\sqrt{3})$
(C) $\frac{1}{2}(1-i\sqrt{3})$
(D) $-\frac{1}{2}(\sqrt{3}-i)$

Answer: (D) $-\frac{1}{2}(\sqrt{3}-i)$ · The council's preliminary key

Q29 TS EAPCET 2026 · 11 May · Shift 1 MCQ

Which of the following is not the possible value of $\sqrt{i}+\sqrt{-i}$?

(A) $2i$
(B) $\sqrt{2}i$
(C) $\sqrt{2}$
(D) $-\sqrt{2}$

Answer: (A) $2i$ · The council's preliminary key

Q30 TS EAPCET 2026 · 11 May · Shift 1 MCQ

If $\sum_{n=1}^{10}\left(i^n+i^{n+1}+i^{n+2}\right)=x+iy$, then $2x+3y=$

(A) 1
(B) -5
(C) $5i$
(D) $-i$

Answer: (B) -5 · The council's preliminary key

Q31 TS EAPCET 2026 · 11 May · Shift 1 MCQ

$$\left(\frac{1+\sin\frac{4\pi}{9}-i\cos\frac{4\pi}{9}}{1+\sin\frac{4\pi}{9}+i\cos\frac{4\pi}{9}}\right)^6=$$

(A) i
(B) $\frac{\sqrt{3}-i}{2}$
(C) $\frac{1-\sqrt{3}i}{2}$
(D) $1+i$

Answer: (C) $\frac{1-\sqrt{3}i}{2}$ · The council's preliminary key

Q32 TS EAPCET 2026 · 11 May · Shift 1 MCQ

If ω is the complex cube root of unity, then $\left(\frac{\sqrt{3}-i}{-\sqrt{2}+\sqrt{2}i}\right)^{20}=$

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(A) ω
(B) $\omega - \omega^2$
(C) ω^2
(D) $-\omega$

Answer: (D) $-\omega$ · The council's preliminary key

Q33 TS EAPCET 2026 · 11 May · Shift 2 MCQ

If z is a complex number such that $\left|9z + \frac{1}{z}\right| = 8$, then the maximum value of $|z|$ is

(A) $\frac{1}{8}$
(B) $\frac{2}{5}$
(C) $\frac{7}{2}$
(D) 1

Answer: (D) 1 · The council's preliminary key

Q34 TS EAPCET 2026 · 11 May · Shift 2 MCQ

If the curve represented by the locus of a point in the Argand plane corresponding to the complex number z satisfying the relation $\mathrm{Re}\left(\frac{z+4}{2z-5}\right) + \mathrm{Re}\left(\frac{\bar{z}+4}{2\bar{z}-5}\right) = 4$ cuts the X-axis at two points A and B, then the sum of the abscissae of those two points is

(A) 0
(B) $\frac{5}{4}$
(C) $\frac{43}{6}$
(D) $\frac{53}{7}$

Answer: (C) $\frac{43}{6}$ · The council's preliminary key

Q35 TS EAPCET 2026 · 11 May · Shift 2 MCQ

If a complex number α is a common root of $x^{2026} + x^{1964} + 1 = 0$ and $x^3 + 2x^2 + 2x + 1 = 0$, then the sum of the complex roots of the equation $z^3 = \alpha^3$ is

(A) $2 + 3i$
(B) $-\frac{1}{2} + \frac{\sqrt{3}}{2}i$
(C) 1
(D) -1

Answer: (D) -1 · The council's preliminary key

Q36 TS EAPCET 2026 · 11 May · Shift 2 MCQ

One of the 5th roots of ω is

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(A) $\text{cis}\left(\frac{4\pi}{3}\right)$
(B) $\text{cis}\left(\frac{7\pi}{15}\right)$
(C) $\text{cis}\left(\frac{11\pi}{15}\right)$
(D) $\text{cis}\left(\frac{9\pi}{15}\right)$

Answer: (A) $\text{cis}\left(\frac{4\pi}{3}\right)$ · The council's preliminary key

Q37 TS EAPCET 2026 · 10 May · Shift 1 MCQ

Number of values of a complex number z satisfying the condition $z = z^2 + i\,\text{Im}(\bar{z})$ is

(A) 0
(B) 2
(C) 1
(D) 3

Answer: (B) 2 · The council's preliminary key

Q38 TS EAPCET 2026 · 10 May · Shift 1 MCQ

If $z = x + iy$ and the point P denotes z in the Argand plane, then the locus of P satisfying the condition $\text{Im}\left(\frac{z-3i}{z+2}\right) = 1$, $z \neq -2$ is

(A) $7x - 2y + 10 = 0$
(B) $x^2 + xy + y^2 + 7x - 2y + 10 = 0$
(C) $x^2 - xy + y^2 + 7x - 2y + 10 = 0$
(D) $x^2 + y^2 + 7x - 2y + 10 = 0$

Answer: (D) $x^2 + y^2 + 7x - 2y + 10 = 0$ · The council's preliminary key

Q39 TS EAPCET 2026 · 10 May · Shift 1 MCQ

If α and β are the roots of the quadratic equation $x^2 - 2x + 2 = 0$ then $\alpha^{2026} + \beta^{2026} =$

(A) -2^{2026}
(B) 2^{1014}
(C) -2^{1014}
(D) 0

Answer: (D) 0 · The council's preliminary key

Q40 TS EAPCET 2026 · 10 May · Shift 1 MCQ

One of the values of $(\sqrt{3} - i)^{5/3}$ is

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(A) $2^{5/3}\,\mathrm{cis}\,\frac{5\pi}{18}$

(B) $2^{5/3}\,\mathrm{cis}\,\frac{19\pi}{18}$

(C) $2^{5/3}\,\mathrm{cis}\,\frac{23\pi}{18}$

(D) $2^{5/3}\,\mathrm{cis}\,\frac{17\pi}{18}$

Answer: (B) $2^{5/3}\,\mathrm{cis}\,\frac{19\pi}{18}$ · The council's preliminary key

Q41 TS EAPCET 2026 · 10 May · Shift 2 MCQ

Let z be a complex number such that $\mathrm{Re}(z) = 3$ and $\mathrm{Im}(z) \neq 0$. If $\frac{3z-n}{z+n} = \frac{5-i}{2}$ for a real number n, then $n - \mathrm{Im}(z) =$

(A) 5

(B) 3

(C) 1

(D) 0

Answer: (A) 5 · The council's preliminary key

Q42 TS EAPCET 2026 · 10 May · Shift 2 MCQ

If $z = \frac{(1-i)^2}{(-\sqrt{3}+i)^3}$ then the principal amplitude of z is

(A) $-\frac{\pi}{2}$

(B) $\frac{\pi}{2}$

(C) π

(D) $-\frac{\pi}{3}$

Answer: (C) π · The council's preliminary key

Q43 TS EAPCET 2026 · 10 May · Shift 2 MCQ

If $z = \left(\sqrt{3}-i\right)^{2025} + \left(-1-\sqrt{3}i\right)^{2026}$ then the point corresponding to z in Argand plane lies in

(A) 1st quadrant

(B) 2nd quadrant

(C) 3rd quadrant

(D) 4th quadrant

Answer: (C) 3rd quadrant · The council's preliminary key

Q44 TS EAPCET 2026 · 10 May · Shift 2 MCQ

If one of the values of $\sqrt{-1-\sqrt{3}i}$ is $\alpha + i\beta$, $\alpha < 0$ and $\beta > 0$, then $\alpha =$

(A) $-\frac{1}{\sqrt{2}}$
(B) $-\frac{\sqrt{3}}{\sqrt{2}}$
(C) $-\sqrt{3}$
(D) $-\sqrt{2}$

Answer: (A) $-\frac{1}{\sqrt{2}}$ · The council's preliminary key

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Q45 TS EAPCET 2026 · 9 May · Shift 1 MCQ

If $A = \{z = x + iy \,/\, |z-4| < |z-2| \;\&\; |z-7| > |z-3|\}$,

$B = \{z = x + iy \,/\, -3 \le y \le 3,\ x \in N,\ y \in Z\}$,

$C = A \cap B$,

then $n(C) =$

(A) 11
(B) 16
(C) 7
(D) 12

Answer: (C) 7 · The council's preliminary key

Q46 TS EAPCET 2026 · 9 May · Shift 1 MCQ

z_1 and z_2 are two complex numbers such that $|z_1 - \alpha| = |z_2 - \alpha|$ for $\alpha \in R$.

If $\text{Arg}(z_1 - \alpha) + \text{Arg}(z_2 - \alpha) = \frac{\pi}{2}$ then $\frac{\overline{z_1 - \alpha}}{z_2 - \alpha} =$

(A) α
(B) i
(C) $-i$
(D) $i\alpha$

Answer: (C) $-i$ · The council's preliminary key

Q47 TS EAPCET 2026 · 9 May · Shift 1 MCQ

If ω is the complex cube root of 1, then

$(1+\omega)(1+\omega^2)(1+\omega^4)(1+\omega^5)(1+\omega^7)(1+\omega^8)\ldots\ldots$ 2 n factors $=$

(A) -1
(B) 0
(C) 1
(D) 2

Answer: (C) 1 · The council's preliminary key

Q48 TS EAPCET 2026 · 9 May · Shift 1 MCQ

m, n and k are integers and $9.5 \leq n \leq 12$.

If $\frac{(\cos\theta+i\sin\theta)^m}{(\sin\theta+i\cos\theta)^n} = k(\sin 17\theta - i\cos 17\theta)$, then $n-m-k=$

(A) 6

(B) 12

(C) 5

(D) 7

Answer: (A) 6 · The council's preliminary key

Q49 TS EAPCET 2026 · 9 May · Shift 2 MCQ

If $z = i^i$, then $z^i =$

(A) $-i$

(B) i

(C) 1

(D) -1

Answer: (A) $-i$ · The council's preliminary key

Q50 TS EAPCET 2026 · 9 May · Shift 2 MCQ

If $\sqrt{-4x+2i\sqrt{x^4+2x^2+9}} = \pm(a+ib)$, then $a^2+b^2-6=$

(A) x^4

(B) $2x^2$

(C) $4x$

(D) x^4+2x^2

Answer: (B) $2x^2$ · The council's preliminary key

Q51 TS EAPCET 2026 · 9 May · Shift 2 MCQ

Product of all the five values of $(1-i)^{4/5}$ is

(A) 4

(B) -2

(C) -4

(D) 2

Answer: (C) -4 · The council's preliminary key

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Q52 TS EAPCET 2026 · 9 May · Shift 2 MCQ

If $\sqrt[3]{i} = \operatorname{cis}\alpha$, α belongs to second quadrant and $\sqrt[3]{-i} = \operatorname{cis}\beta$, β belongs to third quadrant then $\operatorname{cis}\alpha + \operatorname{cis}\beta =$

(A) $\sqrt{3}$
(B) i
(C) $-i$
(D) $-\sqrt{3}$

Answer: (D) $-\sqrt{3}$ · The council's preliminary key

Q53 AP EAPCET 2025 · 27 May · Shift 1 MCQ

If z and ω are two non-zero complex numbers such that $|z\omega| = 1$ and $\operatorname{Arg} z - \operatorname{Arg}\omega = \frac{\pi}{2}$ then $\overline{z}\omega =$

(A) i
(B) -1
(C) 1
(D) $-i$

Answer: (D) $-i$ · The council's preliminary key

Q54 AP EAPCET 2025 · 27 May · Shift 1 MCQ

Let z satisfy $|z| = 1$, $z = 1 - \overline{z}$ and $\operatorname{Im}(z) > 0$

Statement-I : z is a real number

Statement-II : Principal argument of z is $\frac{\pi}{3}$.

Then

(A) Statement-I is true, Statement-II is true and Statement-II is a correct explanation of statement-I
(B) Statement-I is true, Statement-II is true, but Statement-II is not a correct explanation of statement-I
(C) Statement-I is false, Statement-II is true
(D) Statement-I is true, Statement-II is false

Answer: (C) Statement-I is false, Statement-II is true · The council's preliminary key

Q55 AP EAPCET 2025 · 27 May · Shift 1 MCQ

If ω_1 and ω_2 are two non-zero complex numbers and a, b are non zero real numbers such that $|a\omega_1 + b\omega_2| = |a\omega_1 - b\omega_2|$, then $\frac{\omega_1}{\omega_2}$ is

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(A) a positive real number
(B) a negative real number
(C) zero
(D) purely imaginary number

Answer: (D) purely imaginary number · The council's preliminary key

Q56 AP EAPCET 2025 · 26 May · Shift 1 MCQ

If a complex number $z = x + iy$ represents a point P on the Argand plane and $\text{Arg}\left(\frac{z-3+2i}{z+2-3i}\right) = \frac{\pi}{4}$, then the locus of P is a

(A) circle with the line $x + y = 12$ as its diameter
(B) circle with radius $\sqrt{11}$
(C) circle with the line $x - y = 6$ as its diameter
(D) circle with radius 5

Answer: (D) circle with radius 5 · The council's preliminary key

Q57 AP EAPCET 2025 · 26 May · Shift 1 MCQ

By taking $\sqrt{a \pm ib} = x \pm iy,\ x > 0$, if we get $\frac{\sqrt{21 + 12\sqrt{2}i}}{\sqrt{21 - 12\sqrt{2}i}} = a + ib$, then $\frac{b}{a} =$

(A) $\frac{4\sqrt{2}}{7}$
(B) $\frac{12\sqrt{2}}{17}$
(C) $\frac{4\sqrt{3}}{7}$
(D) $\frac{12\sqrt{3}}{17}$

Answer: (A) $\frac{4\sqrt{2}}{7}$ · The council's preliminary key

Q58 AP EAPCET 2025 · 26 May · Shift 1 MCQ

Two values of $(-8 - 8\sqrt{3}\text{i})^{1/4}$ are

(A) $\sqrt{3} - \text{i}, -1 - \sqrt{3}\text{i}$
(B) $\sqrt{3} + \text{i}, 1 + \sqrt{3}\text{i}$
(C) $-\sqrt{3} + \text{i}, \sqrt{3} + \text{i}$
(D) $1 - \sqrt{3}\text{i}, \sqrt{3} + \text{i}$

Answer: (A) $\sqrt{3} - \text{i}, -1 - \sqrt{3}\text{i}$ · The council's preliminary key

Q59 AP EAPCET 2025 · 26 May · Shift 2 MCQ

If $x = 3 - 2\sqrt{3}i$, then $x^4 - 12x^3 + 54x^2 - 108x - 54 =$

(A) 0
(B) 6
(C) -6
(D) 9

Answer: (D) 9 · The council's preliminary key

Q60 AP EAPCET 2025 · 26 May · Shift 2 MCQ

z_1, z_2, z_3 represent the vertices A, B, C of a triangle ABC respectively in the Argand plane. If $|z_1 - z_2| = \sqrt{25 - 12\sqrt{3}}$, $\left|\frac{z_1 - z_3}{z_2 - z_3}\right| = \frac{3}{4}$ and $\angle ACB = 30^\circ$, then the area (in sq. units) of that triangle is

(A) $\frac{3}{2}$
(B) 3
(C) 5
(D) $\frac{5}{2}$

Answer: (B) 3 · The council's preliminary key

Q61 AP EAPCET 2025 · 26 May · Shift 2 MCQ

The product of the four values of the complex number $(1+i)^{3/4}$ is

(A) $2(1+i)$
(B) $2(1-i)$
(C) $2^3(1+i)$
(D) $2^3(1-i)$

Answer: (B) $2(1-i)$ · The council's preliminary key

Q62 AP EAPCET 2025 · 24 May · Shift 1 MCQ

If the point P denotes the complex number $z = x + iy$ in the Argand plane and $\frac{z-(2-i)}{z+(1+2i)}$ is purely imaginary number, then the locus of P is

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(A) a hyperbola not containing the point $(-1, -2)$
(B) an ellipse not containing the point $(-1, -2)$
(C) a parabola not containing the point $(-1, -2)$
(D) a circle not containing the point $(-1, -2)$ and having its centre on the line $x + y + 1 = 0$

Answer: (D) a circle not containing the point $(-1, -2)$ and having its centre on the line $x + y + 1 = 0$ · The council's preliminary key

Q63 AP EAPCET 2025 · 24 May · Shift 1 MCQ

If $(\sqrt{3} - \mathrm{i})^n = 2^n$, $n \in N$, then the least possible value of n is

(A) 3
(B) 4
(C) 6
(D) 12

Answer: (D) 12 · The council's preliminary key

Q64 AP EAPCET 2025 · 24 May · Shift 1 MCQ

$\left(1 + \sqrt{5} + \mathrm{i}\sqrt{10 - 2\sqrt{5}}\right)^5 =$

(A) 1024
(B) -1024
(C) 512
(D) -512

Answer: (B) -1024 · The council's preliminary key

Q65 AP EAPCET 2025 · 23 May · Shift 1 MCQ

For any two non-zero complex numbers z_1 and z_2, if $|z_1 + z_2|^2 = |z_1|^2 + |z_2|^2$, then

(A) $\mathrm{Re}\left(\frac{z_1}{z_2}\right) = 0$
(B) $\mathrm{Im}\left(\frac{z_1}{z_2}\right) = 0$
(C) $\mathrm{Re}(z_1 z_2) = 0$
(D) $\mathrm{Im}(z_1 z_2) = 0$

Answer: (A) $\mathrm{Re}\left(\frac{z_1}{z_2}\right) = 0$ · The council's preliminary key

Q66 AP EAPCET 2025 · 23 May · Shift 1 MCQ

If $1, \omega, \omega^2$ are the cube roots of unity, then

$$1\left(2+\frac{1}{\omega}\right)\left(2+\frac{1}{\omega^2}\right)+2\left(3+\frac{1}{\omega}\right)\left(3+\frac{1}{\omega^2}\right)+3\left(4+\frac{1}{\omega}\right)\left(4+\frac{1}{\omega^2}\right)+\ldots \text{ 10 terms} =$$

(A) 3080
(B) 3465
(C) 3175
(D) 3715

Answer: (B) 3465 · The council's preliminary key

Q67 AP EAPCET 2025 · 23 May · Shift 1 MCQ

$(1+\sqrt{3}\,\mathrm{i})^6-(\sqrt{3}+\mathrm{i})^6 =$

(A) 0
(B) 32
(C) 64
(D) 128

Answer: (D) 128 · The council's preliminary key

Q68 AP EAPCET 2025 · 23 May · Shift 2 MCQ

If z is a complex number such that $\frac{z-1}{z-i}$ is purely imaginary and locus of z represents a circle with centre (α,β) and radius r; then $\frac{\alpha}{\beta}+\frac{\beta}{\alpha} =$

(A) $4r$
(B) r^2
(C) $2r^2$
(D) $4r^2$

Answer: (D) $4r^2$ · The council's preliminary key

Q69 AP EAPCET 2025 · 23 May · Shift 2 MCQ

If the least positive integer n satisfying the equation $\left(\frac{\sqrt{3}+i}{\sqrt{3}-i}\right)^n=-1$ is p and the least positive integer m satisfying the equation $\left(\frac{1-\sqrt{3}i}{1+\sqrt{3}i}\right)^m=\operatorname{cis}\frac{2\pi}{3}$ is q, then $\sqrt{p^2+q^2} =$

(A) 5
(B) 10
(C) $\sqrt{13}$
(D) $\sqrt{17}$

Answer: (C) $\sqrt{13}$ · The council's preliminary key

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Q70 AP EAPCET 2025 · 22 May · Shift 1 MCQ

The minimum value of $|z-1|+|z-5|$ is

(A) 3
(B) 5
(C) 4
(D) 2

Answer: (C) 4 · The council's preliminary key

Q71 AP EAPCET 2025 · 22 May · Shift 1 MCQ

If $z=x+iy$ and if the point P in the Argand diagram represents z, then the locus of the point P satisfying the equation $2|z-2-3i|=3|z+i-2|$ is a circle with centre

(A) $(10,-21)$
(B) $(-10,21)$
(C) $\left(2,-\frac{21}{5}\right)$
(D) $\left(-2,\frac{21}{5}\right)$

Answer: (C) $\left(2,-\frac{21}{5}\right)$ · The council's preliminary key

Q72 AP EAPCET 2025 · 22 May · Shift 1 MCQ

If z is a non-real root of $x^7=1$, then $1+3z+5z^2+7z^3+9z^4+11z^5+13z^6=$

(A) $\frac{14}{1-z}$
(B) $\frac{-14}{1-z}$
(C) $\frac{15}{1-z}$
(D) $\frac{-15}{1-z}$

Answer: (B) $\frac{-14}{1-z}$ · The council's preliminary key

Q73 AP EAPCET 2025 · 22 May · Shift 2 MCQ

If $z=x+iy$ and $x^2+y^2=1$, then $\dfrac{1+x+iy}{1+x-iy}=$

(A) $\overline{z}$
(B) z
(C) $z+1$
(D) $z-1$

Answer: (B) z · The council's preliminary key

Q74 AP EAPCET 2025 · 22 May · Shift 2 MCQ

If $x^6=(\sqrt{3}-i)^5$, then the product of all of its roots is

(A) $2^5(\sqrt{3}+i)$
(B) $\frac{2^6}{\sqrt{3}+i}$
(C) $2^6(\sqrt{3}-i)$
(D) $\frac{2^6}{\sqrt{3}-i}$

Answer: (D) $\frac{2^6}{\sqrt{3}-i}$ · The council's preliminary key

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Q75 AP EAPCET 2025 · 21 May · Shift 1 MCQ

If $i=\sqrt{-1}$, then $\sum_{n=2}^{30} i^n + \sum_{n=30}^{65} i^{n+3} =$

(A) 0
(B) -1
(C) i
(D) $-i$

Answer: (B) -1 · The council's preliminary key

Q76 AP EAPCET 2025 · 21 May · Shift 1 MCQ

If z_1 and z_2 are two of the nth roots of unity such that the line segment joining them subtends a right angle at the origin then for a positive integer k, n takes the form

(A) $4k$
(B) $4k+1$
(C) $4k+2$
(D) $4k+3$

Answer: (A) $4k$ · The council's preliminary key

Q77 AP EAPCET 2025 · 21 May · Shift 1 MCQ

$\left(\sqrt{\sqrt{2}+1}+i\sqrt{\sqrt{2}-1}\right)^8 =$

(A) 64
(B) $64i$
(C) -64
(D) $-64i$

Answer: (C) -64 · The council's preliminary key

Q78 AP EAPCET 2025 · 21 May · Shift 2 MCQ

If $a=\text{Im}\left(\frac{1+z^2}{2iz}\right)$ and z is any non zero complex number such that $|z|=1$, then $a=$

(A) $\mathrm{Re}(z)$
(B) $\mathrm{Re}(z)\,\mathrm{Im}(z)$
(C) $-\mathrm{Re}(z)$
(D) $\mathrm{Re}(z)+\mathrm{Im}(z)$

Answer: (C) $-\mathrm{Re}(z)$ · The council's preliminary key

Q79 AP EAPCET 2025 · 21 May · Shift 2 MCQ

If $(3+4i)^{2025}=5^{2023}(x+iy)$, then $\sqrt{x^2+y^2}=$

(A) 5
(B) 25
(C) 125
(D) 625

Answer: (B) 25 · The council's preliminary key

Q80 AP EAPCET 2025 · 21 May · Shift 2 MCQ

If $\left(\frac{\cos\theta+i\sin\theta}{\sin\theta+i\cos\theta}\right)^{2024}+\left(\frac{1+\cos\theta+i\sin\theta}{1-\cos\theta+i\sin\theta}\right)^{2025}=x+iy$, then the value of $x+y$ at $\theta=\frac{\pi}{2}$ is

(A) 1
(B) -1
(C) 2
(D) 2024

Answer: (C) 2 · The council's preliminary key

Q81 TS EAPCET 2025 · 4 May · Shift 1 MCQ

$\left(\frac{1+i}{1-i}\right)^{228}=$

(A) $-4\left(\frac{1-i}{1+i}\right)^{226}$
(B) $4\left(\frac{1-i}{1+i}\right)^{226}$
(C) $\left(\frac{1-i}{1+i}\right)^{228}$
(D) $-\left(\frac{1-i}{1+i}\right)^{228}$

Answer: (C) $\left(\frac{1-i}{1+i}\right)^{228}$ · The council's preliminary key

Q82 TS EAPCET 2025 · 4 May · Shift 1 MCQ

Let $z=x+iy$ represent a point $P(x,y)$ in the Argand plane. If z satisfies the condition that amplitude of $\frac{z-3}{z-2i}=-\frac{\pi}{2}$, then the locus of P is

(A) the circle $x^2+y^2-3x-2y=0$

(B) the arc of the circle $x^2+y^2-3x-2y=0$ intercepted by the diameter $2x+3y-6=0$ containing the origin and excluding the points $(3,0)$ and $(0,2)$

(C) the arc of the circle $x^2+y^2-3x-2y=0$ intercepted by the diameter $2x+3y-6=0$ not containing the origin and excluding the points $(3,0)$ and $(0,2)$

(D) the circle $x^2+y^2-3x-2y=0$ not containing the point $(0,2)$

Answer: (B) the arc of the circle $x^2+y^2-3x-2y=0$ intercepted by the diameter $2x+3y-6=0$ containing the origin and excluding the points $(3,0)$ and $(0,2)$ · The council's preliminary key

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Q83 TS EAPCET 2025 · 4 May · Shift 1 MCQ

$\left(1-i\sqrt{3}\right)^{2025}=$

(A) 2^{2025}

(B) 2^{2026}

(C) -2^{2025}

(D) -2^{2026}

Answer: (C) -2^{2025} · The council's preliminary key

Q84 TS EAPCET 2025 · 4 May · Shift 1 MCQ

One of the roots of the equation $(x+1)^4+81=0$ is

(A) $3\left(\frac{1+i}{\sqrt{2}}\right)$

(B) $-\left(\frac{3+\sqrt{2}+3i}{\sqrt{2}}\right)$

(C) $-\left(\frac{3+\sqrt{2}+i}{\sqrt{2}}\right)$

(D) $-\left(\frac{3+3i}{\sqrt{2}}\right)$

Answer: (B) $-\left(\frac{3+\sqrt{2}+3i}{\sqrt{2}}\right)$ · The council's preliminary key

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Q85 TS EAPCET 2025 · 4 May · Shift 2 MCQ

If the eight vertices of a regular octagon are given by the complex numbers $\frac{1}{x_j-2i}$ $(j=1,2,3,4,5,6,7,8)$, then the radius of the circumcircle of the octagon is

(A) $\frac{1}{4}$

(B) $\frac{1}{4}i$

(C) i

(D) 2

Answer: (A) $\frac{1}{4}$ · The council's preliminary key

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Q86 TS EAPCET 2025 · 4 May · Shift 2 MCQ

If $|Z_1 - 3 - 4i| = 5$ and $|Z_2| = 15$ then the sum of the maximum and minimum values of $|Z_1 - Z_2|$ is

(A) 75
(B) 30
(C) 35
(D) 20

Answer: (B) 30 · The council's preliminary key

Q87 TS EAPCET 2025 · 4 May · Shift 2 MCQ

If $Z = r(\cos\theta + i\sin\theta), \left(\theta \neq -\frac{\pi}{2}\right)$ is a solution of $x^3 = i$, then $r^9(\cos\theta + i\sin\theta)^9 =$

(A) $\frac{\sqrt{3}}{2} + \frac{1}{2}i$
(B) 1
(C) $-i$
(D) $\frac{-\sqrt{3}}{2} + \frac{1}{2}i$

Answer: (C) $-i$ · The council's preliminary key

Q88 TS EAPCET 2025 · 4 May · Shift 2 MCQ

If $\omega \neq 1$ is a cube root of unity, then one root among the 7th roots of $(1 + \omega)$ is

(A) $1 + \omega$
(B) $1 - \omega$
(C) $\omega - \omega^2$
(D) $\frac{\omega}{\omega - \omega^2}$

Answer: (A) $1 + \omega$ · The council's preliminary key

Q89 TS EAPCET 2025 · 4 May · Shift 2 MCQ

If $P = \sin\frac{2\pi}{7} + \sin\frac{4\pi}{7} + \sin\frac{8\pi}{7}$ and $Q = \cos\frac{2\pi}{7} + \cos\frac{4\pi}{7} + \cos\frac{8\pi}{7}$, then the point (P, Q) lies on the circle of radius

(A) 1
(B) 0
(C) 2
(D) 4

Answer: (C) 2 · The council's preliminary key

Q90 TS EAPCET 2025 · 3 May · Shift 1 MCQ

One of the values of $\sqrt{24 - 70i} + \sqrt{-24 + 70i}$ is

(A) $2+12i$
(B) $12-2i$
(C) $-12+2i$
(D) $-12-2i$

Answer: (D) $-12-2i$ · The council's preliminary key

Q91 TS EAPCET 2025 · 3 May · Shift 1 MCQ

The set of all values of θ such that $\frac{1-i\cos\theta}{1+2i\sin\theta}$ is purely imaginary is

(A) $\left\{n\pi+(-1)^n\frac{\pi}{4}, n\in z\right\}$
(B) $\left\{\frac{n\pi}{2}+(-1)^n\frac{\pi}{4}, n\in z\right\}$
(C) $\left\{n\pi+(-1)^n\frac{\pi}{2}, n\in z\right\}$
(D) $\left\{2n\pi\pm\frac{\pi}{4}, n\in z\right\}$

Answer: (B) $\left\{\frac{n\pi}{2}+(-1)^n\frac{\pi}{4}, n\in z\right\}$ · The council's preliminary key

Q92 TS EAPCET 2025 · 3 May · Shift 1 MCQ

If $\cos\alpha+\cos\beta+\cos\gamma=0=\sin\alpha+\sin\beta+\sin\gamma$, then $\sin 2\alpha+\sin 2\beta+\sin 2\gamma=$

(A) $\cos(\alpha+\beta)+\cos(\beta+\gamma)+\cos(\gamma+\alpha)$
(B) $\cos^2\alpha+\cos^2\beta+\cos^2\gamma$
(C) $\sin^2\alpha+\sin^2\beta+\sin^2\gamma$
(D) $\cos(2\alpha-\beta-\gamma)+\cos(2\beta-\gamma-\alpha)+\cos(2\gamma-\alpha-\beta)$

Answer: (A) $\cos(\alpha+\beta)+\cos(\beta+\gamma)+\cos(\gamma+\alpha)$ · The council's preliminary key

Q93 TS EAPCET 2025 · 3 May · Shift 1 MCQ

If α is a root of the equation $x^2-x+1=0$ then

$$\left(\alpha+\frac{1}{\alpha}\right)^3+\left(\alpha^2+\frac{1}{\alpha^2}\right)^3+\left(\alpha^3+\frac{1}{\alpha^3}\right)^3+\left(\alpha^4+\frac{1}{\alpha^4}\right)^3+\ldots \text{ to 12 terms}=$$

(A) -32
(B) 32
(C) 0
(D) 16

Answer: (C) 0 · The council's preliminary key

Q94 TS EAPCET 2025 · 3 May · Shift 2 MCQ

The amplitude of the complex number $\frac{(\sqrt{3}+i)(1-\sqrt{3}i)}{(-1+i)(-1-i)}$ is

(A) $\frac{\pi}{2}$
(B) $\frac{\pi}{3}$
(C) $-\frac{5\pi}{12}$
(D) $-\frac{\pi}{6}$

Answer: (D) $-\frac{\pi}{6}$ · The council's preliminary key

Q95 TS EAPCET 2025 · 3 May · Shift 2 MCQ

If a complex number $z = x + iy$ represents a point $P(x, y)$ in the Argand plane and z satisfies the condition that the imaginary part of $\frac{z-3}{z+3i}$ is zero, then the locus of the point P is

(A) $x^2 + y^2 - 3x + 3y = 0,\ (x, y) \neq (0, -3)$
(B) $2xy - 3x + 3y + 9 = 0,\ (x, y) \neq (0, -3)$
(C) $x - y - 3 = 0,\ (x, y) \neq (0, -3)$
(D) $x + y + 3 = 0,\ (x, y) \neq (0, -3)$

Answer: (C) $x - y - 3 = 0,\ (x, y) \neq (0, -3)$ · The council's preliminary key

Q96 TS EAPCET 2025 · 3 May · Shift 2 MCQ

$\left(\sqrt{3} + i\right)^{10} + \left(\sqrt{3} - i\right)^{10} =$

(A) $1024\sqrt{3}$
(B) 1024
(C) 2048
(D) $512\sqrt{3}$

Answer: (B) 1024 · The council's preliminary key

Q97 TS EAPCET 2025 · 3 May · Shift 2 MCQ

Number of real values of $(-1 - \sqrt{3}i)^{3/4}$ is

(A) 0
(B) 1
(C) 2
(D) 3

Answer: (C) 2 · The council's preliminary key

Q98 TS EAPCET 2025 · 2 May · Shift 1 MCQ

If $\frac{2+3i}{i-2} - \frac{4i-3}{3+4i} = x + iy$, then $3x + y =$

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(A) 4
(B) -4
(C) -2
(D) 2

Answer: (B) -4 · The council's preliminary key

Q99 TS EAPCET 2025 · 2 May · Shift 1 MCQ

Let $z = x + iy$ and P(x, y) be a point on the Argand plane. If z satisfies the condition $\text{Arg}\left(\frac{z-3i}{z+2i}\right) = \frac{\pi}{4}$ then the locus of P is

(A) $x^2 + y^2 - y - 6 = 0, (x, y) \neq (0, -2)$
(B) $x^2 + y^2 - x - y - 6 = 0, (x, y) \neq (0, -2)$
(C) $x^2 + y^2 + 5x - y - 6 = 0, (x, y) \neq (0, -2)$
(D) $x^2 + y^2 + x - y - 6 = 0, (x, y) \neq (0, -2)$

Answer: (C) $x^2 + y^2 + 5x - y - 6 = 0, (x, y) \neq (0, -2)$ · The council's preliminary key

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Q100 TS EAPCET 2025 · 2 May · Shift 1 MCQ

If ω is a complex cube root of unity and $x = \omega^2 - \omega + 2$ then

(A) $x^2 - 4x + 7 = 0$
(B) $x^2 + 4x + 7 = 0$
(C) $x^2 - 2x + 4 = 0$
(D) $x^2 + 2x + 4 = 0$

Answer: (A) $x^2 - 4x + 7 = 0$ · The council's preliminary key

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Q101 TS EAPCET 2025 · 2 May · Shift 1 MCQ

The product of all the values of $\left(\sqrt{3} - i\right)^{\frac{3}{7}}$ is

(A) 8
(B) -8
(C) $8i$
(D) $-8i$

Answer: (D) $-8i$ · The council's preliminary key

Q102 TS EAPCET 2025 · 2 May · Shift 2 MCQ

ω is a complex cube root of unity and Z is a complex number satisfying $|Z - 1| \leq 2$.

The possible values of r such that $|Z - 1| \leq 2$ and $|\omega Z - 1 - \omega^2| = r$ have no common solution are

(A) $0 \leq r \leq 4$

(B) $r = |\omega|$ only

(C) $r > 4$

(D) $1 < r < 2$

Answer: (C) $r > 4$ · The council's preliminary key

Q103 TS EAPCET 2025 · 2 May · Shift 2 MCQ

If $|Z| = 2$, $Z_1 = \frac{Z}{2}e^{i\alpha}$ and θ is the amp(Z), then $\frac{Z_1^n - Z_1^{-n}}{Z_1^n + Z_1^{-n}} =$

(A) $2^n i \tan(n\theta + n\alpha)$

(B) $i \tan(n\theta - n\alpha)$

(C) $i \tan(n\theta + n\alpha)$

(D) $\tan(n\theta + n\alpha)$

Answer: (C) $i \tan(n\theta + n\alpha)$ · The council's preliminary key

Q104 TS EAPCET 2025 · 2 May · Shift 2 MCQ

If $n, \mathrm{K} \in \mathrm{N}$ such that $n \neq 3\mathrm{K}$, then $\left(\sqrt{3} + i\right)^{2n} + \left(\sqrt{3} - i\right)^{2n} =$

(A) $(-1)^n 2^{2n+1}$

(B) $(-1)^{n+1} 2^{2n+1}$

(C) $(-1)^{n+1} 2^{2n}$

(D) $(-1)^{n+1} 2^n$

Answer: (C) $(-1)^{n+1} 2^{2n}$ · The council's preliminary key

Q105 TS EAPCET 2025 · 2 May · Shift 2 MCQ

In Argand plane, no value of $\sqrt[3]{1 - i\sqrt{3}}$ lie in

(A) First quadrant

(B) Second quadrant

(C) Third quadrant

(D) Fourth quadrant

Answer: (A) First quadrant · The council's preliminary key

Q106 AP EAPCET 2024 · 23 May · Shift 1 MCQ

ω is a complex cube root of unity and if Z is a complex number satisfying $|Z - 1| \leq 2$ and $|\omega^2 Z - 1 - \omega| = a$, then the set of possible values of a is

(A) $0 \leq a \leq 2$
(B) $\frac{1}{2} \leq a \leq \frac{\sqrt{3}}{2}$
(C) $|\omega| \leq a \leq \frac{\sqrt{3}}{2} + 2$
(D) $0 \leq a \leq 4$

Answer: (D) $0 \leq a \leq 4$ · The council's preliminary key

Q107 AP EAPCET 2024 · 23 May · Shift 1 MCQ

If the roots of the equation $Z^3 + iZ^2 + 2i = 0$ are the vertices of a triangle ABC, then that triangle ABC is

(A) a right angled triangle
(B) an equilateral triangle
(C) an isosceles triangle
(D) a right angled isosceles triangle

Answer: (C) an isosceles triangle · The council's preliminary key

Q108 AP EAPCET 2024 · 23 May · Shift 1 MCQ

(r, θ) denotes $r(\cos\theta + i\sin\theta)$. If $x = (1, \alpha), y = (1, \beta), z = (1, \gamma)$ and $x + y + z = 0$ then $\sum \cos(2\alpha - \beta - \gamma) =$

(A) 3
(B) 0
(C) 1
(D) -1

Answer: (A) 3 · The council's preliminary key

Q109 AP EAPCET 2024 · 22 May · Shift 1 MCQ

If Z is a complex number such that $|Z| \leq 3$ and $\frac{-\pi}{2} \leq amp\, Z \leq \frac{\pi}{2}$, then the area of the region formed by locus of Z is

(A) 9π
(B) $\frac{9\pi}{2}$
(C) 3π
(D) $\frac{9\pi}{4}$

Answer: (B) $\frac{9\pi}{2}$ · The council's preliminary key

Q110 AP EAPCET 2024 · 22 May · Shift 1 MCQ

The locus of the complex number Z such that $arg\left(\frac{Z-1}{Z+1}\right) = \frac{\pi}{4}$ is

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(A) a straight line
(B) a circle
(C) a parabola
(D) an ellipse

Answer: (B) a circle · The council's preliminary key

Q111 AP EAPCET 2024 · 22 May · Shift 1 MCQ

All the values of $(8i)^{1/3}$ are

(A) $\pm(\sqrt{3}+i), -2i$
(B) $\pm\sqrt{3}+i, -2i$
(C) $\pm(\sqrt{3}-i), 2i$
(D) $\pm(2+i), i$

Answer: (B) $\pm\sqrt{3}+i, -2i$ · The council's preliminary key

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Q112 AP EAPCET 2024 · 22 May · Shift 2 MCQ

$$\text{Arg}\left[\frac{(1+i\sqrt{3})(-\sqrt{3}-i)}{(1-i)(-i)}\right] =$$

(A) $\frac{5\pi}{6}$
(B) $\frac{\pi}{4}$
(C) $\frac{2\pi}{3}$
(D) $\frac{-\pi}{2}$

Answer: (B) $\frac{\pi}{4}$ · The council's preliminary key

Q113 AP EAPCET 2024 · 22 May · Shift 2 MCQ

If $P(x, y)$ represents the complex number $z = x + iy$ in the Argand plane and $\text{Arg}\left(\frac{z-3i}{z+4}\right) = \frac{\pi}{2}$, then the equation of the locus of P is

(A) $x^2 + y^2 + 4x - 3y = 0$ and $3x - 4y > 0$
(B) $x^2 + y^2 + 4x - 3y + 2 = 0$ and $3x - 4y > 0$
(C) $x^2 + y^2 + 4x - 3y = 0$ and $3x - 4y < 0$
(D) $x^2 + y^2 + 4x - 3y + 2 = 0$ and $3x - 4y < 0$

Answer: (C) $x^2 + y^2 + 4x - 3y = 0$ and $3x - 4y < 0$ · The council's preliminary key

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Q114 AP EAPCET 2024 · 22 May · Shift 2 MCQ

If $\cos\alpha + 4\cos\beta + 9\cos\gamma = 0$ and $\sin\alpha + 4\sin\beta + 9\sin\gamma = 0$, then $81\cos(2\gamma - 2\alpha) - 16\cos(2\beta - 2\alpha) =$

(A) $1+8\cos(\beta-\alpha)$
(B) $\cos(\beta-\alpha)$
(C) $1-36\cos(\beta-\alpha)$
(D) $1+6\cos(\beta-\alpha)$

Answer: (A) $1+8\cos(\beta-\alpha)$ · The council's preliminary key

Q115 AP EAPCET 2024 · 21 May · Shift 1 MCQ

The complex conjugate of $(4-3i)(2+3i)(1+4i)$ is

(A) $7+74i$
(B) $-7+74i$
(C) $-7-74i$
(D) $7-74i$

Answer: (C) $-7-74i$ · The council's preliminary key

Q116 AP EAPCET 2024 · 21 May · Shift 1 MCQ

If the amplitude of $(Z-2)$ is $\frac{\pi}{2}$, then the locus of Z is

(A) $x=0, y>0$
(B) $x=2, y>0$
(C) $x>0, y=2$
(D) $x>0, y=0$

Answer: (B) $x=2, y>0$ · The council's preliminary key

Q117 AP EAPCET 2024 · 21 May · Shift 1 MCQ

If ω is the cube root of unity, $\frac{a+b\omega+c\omega^2}{c+a\omega+b\omega^2}+\frac{a+b\omega+c\omega^2}{b+c\omega+a\omega^2}=$

(A) 2
(B) -2
(C) 1
(D) -1

Answer: (D) -1 · The council's preliminary key

Q118 AP EAPCET 2024 · 21 May · Shift 2 MCQ

Imaginary part of $\frac{(1-i)^3}{(2-i)(3-2i)}$ is

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(A) $\frac{22}{65}$
(B) $\frac{6}{65}$
(C) $-\frac{6}{65}$
(D) $-\frac{22}{65}$

Answer: (D) $-\frac{22}{65}$ · The council's preliminary key

Q119 AP EAPCET 2024 · 21 May · Shift 2 MCQ

The square root of $7+24i$

(A) $4-3i$
(B) $3+4i$
(C) $3-4i$
(D) $4+3i$

Answer: (D) $4+3i$ · The council's preliminary key

Q120 AP EAPCET 2024 · 21 May · Shift 2 MCQ

If n is an integer and $Z=\cos\theta+i\sin\theta, \theta\neq(2n+1)\frac{\pi}{2}$, then $\frac{1+Z^{2n}}{1-Z^{2n}}=$

(A) $i\tan n\theta$
(B) $i\cot n\theta$
(C) $-i\tan n\theta$
(D) $-i\cot n\theta$

Answer: (B) $i\cot n\theta$ · The council's preliminary key

Q121 AP EAPCET 2024 · 20 May · Shift 1 MCQ

If the point p represents the complex number $z=x+iy$ in the argand plane and if $\frac{z+i}{z-1}$ is a purely imaginary number then the locus of p is

(A) $x^2+y^2+x-y=0$ and $(x,y)\neq(1,0)$
(B) $x^2+y^2-x+y=0$ and $(x,y)\neq(1,0)$
(C) $x^2+y^2-x+y=0$ and $(x,y)=(1,0)$
(D) $x^2+y^2+x+y=0$

Answer: (B) $x^2+y^2-x+y=0$ and $(x,y)\neq(1,0)$ · The council's preliminary key

Q122 AP EAPCET 2024 · 20 May · Shift 1 MCQ

$S=\{z\in\mathbb{C}\mid|z+1-i|=1\}$ represents

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(A) the circle with centre at $(-1, 1)$ and radius 1 unit
(B) the circle with centre at $(1, -1)$ and radius 1 unit
(C) the closed circular disc with centre at $(1, -1)$ and radius 1 unit
(D) the closed circular disc with centre at $(-1, 1)$ and radius 1 unit

Answer: (A) the circle with centre at $(-1, 1)$ and radius 1 unit · The council's preliminary key

Q123 AP EAPCET 2024 · 20 May · Shift 1 MCQ

If $\cos\alpha + \cos\beta + \cos\gamma = \sin\alpha + \sin\beta + \sin\gamma = 0$ then $(\cos^3\alpha + \cos^3\beta + \cos^3\gamma)^2 + (\sin^3\alpha + \sin^3\beta + \sin^3\gamma)^2 =$

(A) 1
(B) $\frac{3}{4}$
(C) $\frac{9}{16}$
(D) $\frac{9}{8}$

Answer: (C) $\frac{9}{16}$ · The council's preliminary key

Q124 AP EAPCET 2024 · 20 May · Shift 2 MCQ

If $z_1 = 10 + 6i$, $z_2 = 4 + 6i$ and z is any complex number such that the argument of $\frac{(z-z_1)}{(z-z_2)}$ is $\frac{\pi}{4}$, then

(A) $|z - 7 - 9i| = 3\sqrt{2}$
(B) $|z - 7 - 9i| = 2\sqrt{2}$
(C) $|z - 3 + 9i| = 3\sqrt{2}$
(D) $|z + 3 - 9i| = 2\sqrt{2}$

Answer: (A) $|z - 7 - 9i| = 3\sqrt{2}$ · The council's preliminary key

Q125 AP EAPCET 2024 · 20 May · Shift 2 MCQ

If $\frac{3-2i\sin\theta}{1+2i\sin\theta}$ is purely imaginary number, then $\theta =$

(A) $2n\pi \pm \frac{\pi}{4}$
(B) $2n\pi \pm \frac{\pi}{2}$
(C) $n\pi \pm \frac{\pi}{3}$
(D) $n\pi \pm \frac{\pi}{6}$

Answer: (C) $n\pi \pm \frac{\pi}{3}$ · The council's preliminary key

Q126 AP EAPCET 2024 · 20 May · Shift 2 MCQ

If $z = x + iy$, $x^2 + y^2 = 1$ and $z_1 = ze^{i\theta}$, then $\frac{z_1^{2n} - 1}{z_1^{2n} + 1} =$

(A) $-i\tan\left(n\left(\theta+\mathrm{Tan}^{-1}\left(\frac{y}{x}\right)\right)\right)$

(B) $i\,\mathrm{Cot}\left(n\left(\theta+\mathrm{Tan}^{-1}\frac{y}{x}\right)\right)$

(C) $i\tan\left(n\left(\theta+\mathrm{Tan}^{-1}\frac{x}{y}\right)\right)$

(D) $i\tan\left(n\left(\theta+\mathrm{Tan}^{-1}\frac{y}{x}\right)\right)$

Answer: (D) $i\tan\left(n\left(\theta+\mathrm{Tan}^{-1}\frac{y}{x}\right)\right)$ · The council's preliminary key

Q127 AP EAPCET 2024 · 19 May · Shift 2 MCQ

If m, n are respectively the least positive and greatest negative integer values of k such that $\left(\frac{1-i}{1+i}\right)^k = -i$, then $m-n=$

(A) 4

(B) 0

(C) 6

(D) 2

Answer: (A) 4 · The council's preliminary key

Q128 AP EAPCET 2024 · 19 May · Shift 2 MCQ

If a complex number z is such that $\frac{z-2i}{z-2}$ is purely imaginary number and the locus of z is a closed curve, then the area of the region bounded by that closed curve and lying in the first quadrant is

(A) 2π

(B) $\frac{\pi}{2}$

(C) π

(D) $\frac{\pi}{4}$

Answer: (C) π · Checked by our team

Q129 AP EAPCET 2024 · 19 May · Shift 2 MCQ

Real part of $\frac{(\cos a+i\sin a)^6}{(\sin b+i\cos b)^8}$ is

(A) $\sin(6a-8b)$

(B) $\cos(6a-8b)$

(C) $\sin(6a+8b)$

(D) $\cos(6a+8b)$

Answer: (D) $\cos(6a+8b)$ · The council's preliminary key

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Q130 AP EAPCET 2024 · 18 May · Shift 1 MCQ

If real parts of $\sqrt{-5-12i}$, $\sqrt{5+12i}$ are positive values, the real part of $\sqrt{-8-6i}$ is a negative value and $a+ib=\dfrac{\sqrt{-5-12i}+\sqrt{5+12i}}{\sqrt{-8-6i}}$ then $2a+b=$

(A) 3
(B) 2
(C) -3
(D) -2

Answer: (C) -3 · The council's preliminary key

Q131 AP EAPCET 2024 · 18 May · Shift 1 MCQ

The set of all real values of c for which the equation $z\bar{z}+(4-3i)\bar{z}+(4+3i)z+c=0$ represents a circle is

(A) $[25,\infty)$
(B) $[-5,5]$
(C) $(-\infty,-5]\cup[5,\infty)$
(D) $(-\infty,25]$

Answer: (D) $(-\infty,25]$ · The council's preliminary key

Q132 AP EAPCET 2024 · 18 May · Shift 1 MCQ

If $Z=x+iy$ is a complex number, then the number of distinct solutions of the equation $z^3+\bar{z}=0$ is

(A) 1
(B) 3
(C) Infinite
(D) 5

Answer: (D) 5 · The council's preliminary key

Q133 TS EAPCET 2024 · 11 May · Shift 1 MCQ

If $z=\dfrac{(2-i)(1+i)^3}{(1-i)^2}$, then $\mathrm{Arg}(z)=$

(A) $\text{Tan}^{-1}\left(\frac{1}{3}\right) - \pi$

(B) $\text{Tan}^{-1}\left(\frac{3}{4}\right) - \pi$

(C) $\pi - \text{Tan}^{-1}\left(\frac{3}{4}\right)$

(D) $\text{Tan}^{-1}\left(\frac{1}{3}\right)$

Answer: (A) $\text{Tan}^{-1}\left(\frac{1}{3}\right) - \pi$ · The council's preliminary key

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Q134 TS EAPCET 2024 · 11 May · Shift 1 MCQ

$z = x + iy$ and the point P represents z in the Argand plane. If the amplitude of $\left(\frac{2z - i}{z + 2i}\right)$ is $\frac{\pi}{4}$, then the equation of the locus of P is

(A) $2x^2 + 2y^2 - 3x + 3y - 2 = 0, (x, y) \neq (0, -2)$

(B) $2x^2 + 2y^2 + 5x + 3y - 2 = 0, (x, y) \neq (0, -2)$

(C) $2x^2 + 2y^2 + 3x + 3y - 2 = 0, (x, y) \neq (0, 2)$

(D) $2x^2 + 2y^2 - 5x + 3y - 2 = 0, (x, y) \neq (0, 2)$

Answer: (B) $2x^2 + 2y^2 + 5x + 3y - 2 = 0, (x, y) \neq (0, -2)$ · The council's preliminary key

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Q135 TS EAPCET 2024 · 11 May · Shift 1 MCQ

α, β are the roots of the equation $x^2 + 2x + 4 = 0$. If the point representing α in the Argand diagram lies in the 2nd quadrant and $\alpha^{2024} - \beta^{2024} = ik$, $(i = \sqrt{-1})$, then $k =$

(A) $-2^{2025}\sqrt{3}$

(B) $2^{2025}\sqrt{3}$

(C) $-2^{2024}\sqrt{3}$

(D) $2^{2024}\sqrt{3}$

Answer: (C) $-2^{2024}\sqrt{3}$ · The council's preliminary key

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Q136 TS EAPCET 2024 · 11 May · Shift 1 MCQ

If α is a root of the equation $x^2 - x + 1 = 0$, then

$$\left(\alpha + \frac{1}{\alpha}\right)^3 + \left(\alpha^2 + \frac{1}{\alpha^2}\right)^3 + \left(\alpha^3 + \frac{1}{\alpha^3}\right)^3 + \left(\alpha^4 + \frac{1}{\alpha^4}\right)^3 =$$

(A) 0
(B) 1
(C) -3
(D) -9

Answer: (D) -9 · The council's preliminary key

Q137 TS EAPCET 2024 · 10 May · Shift 1 MCQ

If x and y are two positive real numbers such that $x+iy=\dfrac{13\sqrt{-5+12i}}{(2-3i)(3+2i)}$ then $13y-26x=$

(A) 28
(B) 39
(C) 42
(D) 54

Answer: (A) 28 · The council's preliminary key

Q138 TS EAPCET 2024 · 10 May · Shift 1 MCQ

If $z=x+iy$ and if the point P represents z in the Argand plane, then the locus of z satisfying the equation $|z-1|+|z+i|=2$ is

(A) $15x^2-2xy+15y^2-16x+16y-48=0$
(B) $3x^2+2xy+3y^2-4x-4y=0$
(C) $3x^2-2xy+3y^2-4x+4y=0$
(D) $15x^2+2xy+15y^2+16x-16y-48=0$

Answer: (C) $3x^2-2xy+3y^2-4x+4y=0$ · The council's preliminary key

Q139 TS EAPCET 2024 · 10 May · Shift 1 MCQ

One of the values of $(-64i)^{5/6}$ is

(A) $32i$
(B) $16\sqrt{2}(1+i)$
(C) $32(1+i)$
(D) $16\sqrt{2}\,i$

Answer: (B) $16\sqrt{2}(1+i)$ · The council's preliminary key

Q140 TS EAPCET 2024 · 10 May · Shift 1 MCQ

If α,β are the roots of the equation $x+\frac{4}{x}=2\sqrt{3}$, then $\frac{2}{\sqrt{3}}\left|\alpha^{2024}-\beta^{2024}\right|=$

(A) 2^{2024}

(B) 2^{2025}

(C) 2^{2023}

(D) 2^{1012}

Answer: (B) 2^{2025} · The council's preliminary key

Q141 TS EAPCET 2024 · 10 May · Shift 2 MCQ

If $z = x + iy$ satisfies the equation $z^2 + az + a^2 = 0$, $a \in \mathbb{R}$, then

(A) $|z| = |a|$

(B) $|z - a| = |a|$

(C) $z = |a|$

(D) $z = a$

Answer: (A) $|z| = |a|$ · The council's preliminary key

Q142 TS EAPCET 2024 · 10 May · Shift 2 MCQ

If Z_1, Z_2, Z_3 are three complex numbers with unit modulus such that $|Z_1 - Z_2|^2 + |Z_1 - Z_3|^2 = 4$ then $Z_1\overline{Z_2} + \overline{Z_1}Z_2 + Z_1\overline{Z_3} + \overline{Z_1}Z_3 =$

(A) 0

(B) $|Z_2|^2 + |Z_3|^2$

(C) $|Z_1|^2 - |Z_2 + Z_3|^2$

(D) 1

Answer: (A) 0 · The council's preliminary key

Q143 TS EAPCET 2024 · 10 May · Shift 2 MCQ

If ω is the complex cube root of unity and $\left(\frac{a + b\omega + c\omega^2}{c + a\omega + b\omega^2}\right)^K + \left(\frac{a + b\omega + c\omega^2}{b + a\omega^2 + c\omega}\right)^l = 2$, then $2k + l$ is always

(A) divisible by 2

(B) divisible by 6

(C) divisible by 3

(D) divisible by 5

Answer: (C) divisible by 3 · The council's preliminary key

Q144 TS EAPCET 2024 · 10 May · Shift 2 MCQ

If $Z_1 = \sqrt{3} + i\sqrt{3}$ and $Z_2 = \sqrt{3} + i$, and $\left(\frac{Z_1}{Z_2}\right)^{50} = x + iy$, then the point (x, y) lies in

(A) first quadrant
(B) second quadrant
(C) third quadrant
(D) fourth quadrant

Answer: (A) first quadrant · The council's preliminary key

Q145 TS EAPCET 2024 · 9 May · Shift 1 MCQ

If $\sqrt{5}-i\sqrt{15}=\mathrm{r}(\cos\theta+i\sin\theta)$, $-\pi<\theta<\pi$, then $r^2(\sec\theta+3\mathrm{cosec}^2\theta)=$

(A) 40
(B) 60
(C) 120
(D) 180

Answer: (C) 120 · The council's preliminary key

Q146 TS EAPCET 2024 · 9 May · Shift 1 MCQ

The point P denotes the complex number $z=x+iy$ in the Argand plane. If $\frac{2z-i}{z-2}$ is a purely real number, then the equation of the locus of P is

(A) $2x^2+2y^2-4x-y=0$
(B) $x+4y-2=0\ \&\ (x,y)\neq(2,0)$
(C) $x-4y-2=0\ \&\ (x,y)\neq(2,0)$
(D) $x^2+y^2-4x-2y=0$

Answer: (B) $x+4y-2=0\ \&\ (x,y)\neq(2,0)$ · The council's preliminary key

Q147 TS EAPCET 2024 · 9 May · Shift 1 MCQ

x and y are two complex numbers such that $|x|=|y|=1$. If $\mathrm{Arg}(x)=2\alpha$, $\mathrm{Arg}(y)=3\beta$ and $\alpha+\beta=\frac{\pi}{36}$, then $x^6y^4+\frac{1}{x^6y^4}=$

(A) 0
(B) -1
(C) 1
(D) $\frac{1}{2}$

Answer: (C) 1 · The council's preliminary key

Q148 TS EAPCET 2024 · 9 May · Shift 1 MCQ

One of the roots of the equation $x^{14}+x^9-x^5-1=0$ is

(A) $\frac{1+\sqrt{3}i}{2}$

(B) $\frac{\sqrt{5}-1}{4}+i\frac{\sqrt{10-2\sqrt{5}}}{4}$

(C) $\frac{1-\sqrt{3}i}{2}$

(D) $\frac{\sqrt{5}+1}{4}+i\frac{\sqrt{10-2\sqrt{5}}}{4}$

Answer: (D) $\frac{\sqrt{5}+1}{4}+i\frac{\sqrt{10-2\sqrt{5}}}{4}$ · The council's preliminary key

Q149 TS EAPCET 2024 · 9 May · Shift 2 MCQ

If $\frac{(2-i)x+(1+i)}{2+i}+\frac{(1-2i)y+(1-i)}{1+2i}=1-2i$, then $2x+4y=$

(A) 5

(B) -2

(C) 1

(D) -1

Answer: (A) 5 · The council's preliminary key

Q150 TS EAPCET 2024 · 9 May · Shift 2 MCQ

If $z=1-\sqrt{3}\,i$, then $z^3-3z^2+3z=$

(A) 0

(B) $1+3\sqrt{3}\,\mathrm{i}$

(C) 1

(D) $2+3\sqrt{3}\,\mathrm{i}$

Answer: (B) $1+3\sqrt{3}\,\mathrm{i}$ · The council's preliminary key

Q151 TS EAPCET 2024 · 9 May · Shift 2 MCQ

The product of all the values of $(\sqrt{3}-i)^{2/5}$ is

(A) $2(\sqrt{3}-i)$

(B) $2(\sqrt{3}+i)$

(C) $2(1-\sqrt{3}i)$

(D) $2(1+\sqrt{3}i)$

Answer: (C) $2(1-\sqrt{3}i)$ · The council's preliminary key

Q152 TS EAPCET 2024 · 9 May · Shift 2 MCQ

The number of common roots among the 12th and 30th roots of unity is

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(A) 12
(B) 9
(C) 8
(D) 6

Answer: (D) 6 · The council's preliminary key

Q153 AP EAPCET 2023 · 19 May · Shift 1 MCQ

$\text{Arg}\left(\frac{4+2i}{1-2i}+\frac{3+4i}{2+3i}\right)$ lies in the interval

(A) $\left(\frac{\pi}{4},\frac{\pi}{2}\right)$
(B) $\left(-\pi,\frac{-\pi}{2}\right)$
(C) $\left(\frac{-\pi}{2},0\right)$
(D) $\left(0,\frac{\pi}{4}\right)$

Answer: (A) $\left(\frac{\pi}{4},\frac{\pi}{2}\right)$ · The council's preliminary key

Q154 AP EAPCET 2023 · 19 May · Shift 1 MCQ

The multiplicative inverse of z is

(A) $\frac{1}{z+\overline{z}}$
(B) $\frac{z}{\overline{|z|}}$
(C) $\frac{\overline{z}}{|z|^2}$
(D) $\frac{1}{\overline{z}}$

Answer: (C) $\frac{\overline{z}}{|z|^2}$ · The council's preliminary key

Q155 AP EAPCET 2023 · 19 May · Shift 1 MCQ

If $1,\omega,\omega^2$ are the cube roots of unity, then the roots of the equation $8z^3-12z^2+6z-28=0$ are

(A) $2,3\omega,3\omega^2+1$
(B) $2,\frac{3\omega+1}{2},\frac{3\omega^2+1}{2}$
(C) $2,\frac{1+3\omega}{3},\frac{1+3\omega^2}{3}$
(D) $2,\frac{1-\omega}{2},\frac{1-\omega^2}{2}$

Answer: (B) $2,\frac{3\omega+1}{2},\frac{3\omega^2+1}{2}$ · The council's preliminary key

Q156 AP EAPCET 2023 · 19 May · Shift 1 MCQ

If $z_1=2+3i$, $z_2=4-5i$ and z_3 are three points in the Argand plane such that $5z_1+xz_2+yz_3=0$ $(x,y\in\mathbb{R})$ and z_3 is the midpoint of the line segment joining the points z_1 and z_2, then $x+y=$

(A) -5
(B) 0
(C) 4
(D) -1

Answer: (A) -5 · The council's preliminary key

Q157 AP EAPCET 2023 · 18 May · Shift 1 MCQ

If $z = x + iy$ represents a point in the Argand plane, then a point which is not in the region represented by $|z - 1 + i| \leq 2$ is

(A) $\frac{1-i}{2}$
(B) 1
(C) $\frac{1-i}{4}$
(D) i

Answer: (D) i · The council's preliminary key

Q158 AP EAPCET 2023 · 18 May · Shift 1 MCQ

Let the locus of a point z in the Argand plane satisfying the condition $\mathrm{Re}(z^2) = 4$ be C1 and the locus of z satisfying the condition $\mathrm{Im}(z^2) = 4$ be C2. Then the number of common points of the two curves C_1 and C_2 are

(A) 0
(B) 3
(C) 4
(D) 2

Answer: (D) 2 · The council's preliminary key

Q159 AP EAPCET 2023 · 18 May · Shift 1 MCQ

If ω is a complex cube root of unity, then $\sin\left[\left(\omega^{10} + \omega^{23}\right)\pi - \frac{\pi}{4}\right] =$

(A) $1/\sqrt{2}$
(B) $1/2$
(C) 1
(D) $\sqrt{3}/2$

Answer: (A) $1/\sqrt{2}$ · The council's preliminary key

Q160 AP EAPCET 2023 · 18 May · Shift 1 MCQ

If z is a point on the circle $|z| = 1$ with $\mathrm{Arg}(z) = \frac{\pi}{6}$, then $\frac{z^{12} + 1 - z^6}{z^{12} + iz^6 - 1} =$

(A) $2+3i$
(B) $3i$
(C) $3+2i$
(D) $4+3i$

Answer: (B) $3i$ · The council's preliminary key

Q161 AP EAPCET 2023 · 18 May · Shift 2 MCQ

If $-3+ix^2y$ and x^2+y+4i are complex conjugates, then $x=$

(A) 0
(B) ± 1
(C) ± 3
(D) ± 4

Answer: (B) ± 1 · The council's preliminary key

Q162 AP EAPCET 2023 · 18 May · Shift 2 MCQ

If $z=1+\cos\theta-i\sin\theta$ and $0<\theta<\pi$, then $\left[|z-1|^2-\frac{|z|^2}{4}\right]^{1/2}=$

(A) $\sqrt{2}\cos\theta$
(B) $\sqrt{2}\sin\theta$
(C) $\cos\left(\frac{\theta}{2}\right)$
(D) $\sin\left(\frac{\theta}{2}\right)$

Answer: (D) $\sin\left(\frac{\theta}{2}\right)$ · The council's preliminary key

Q163 AP EAPCET 2023 · 18 May · Shift 2 MCQ

In the Argand plane, the values of z satisfying the equation $|z-1|=|i(z+1)|$ lie on

(A) the Y – axis
(B) a Parabola
(C) a Hyperbola
(D) the X – axis

Answer: (A) the Y – axis · The council's preliminary key

Q164 AP EAPCET 2023 · 18 May · Shift 2 MCQ

If $1,\omega,\omega^2$ are the cube roots of unity and $(x+y)(x\omega+y\omega^2)(x\omega^2+y\omega)=f(x,y)$, then $f(2,3)=$

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(A) 16
(B) 24
(C) 35
(D) 45

Answer: (C) 35 · The council's preliminary key

Q165 AP EAPCET 2023 · 17 May · Shift 1 MCQ

For real numbers a and b, if $4a + i(3a - b) = b - 6i$ and $z = a + \frac{b}{4}i$, then $\frac{|z|}{a} =$

(A) $2\sqrt{2}$
(B) $6\sqrt{2}$
(C) $\sqrt{2}$
(D) 2

Answer: (C) $\sqrt{2}$ · The council's preliminary key

Q166 AP EAPCET 2023 · 17 May · Shift 1 MCQ

If $z = (1 - i)^3(x + i)$ is a purely imaginary number for $x = x_1$ and if z is a purely real number for $x = x_2$, then $x_1x_2 =$

(A) -1
(B) 0
(C) 1
(D) 2

Answer: (A) -1 · The council's preliminary key

Q167 AP EAPCET 2023 · 17 May · Shift 1 MCQ

If $1, \omega, \omega^2$ are the cube roots of unity, k is positive integer and $(1 - \omega + \omega^2)^{3k} + (1 - \omega^2 + \omega)^{3k} = (1 - \omega + \omega^2)^{3k+1} + (1 + \omega - \omega^2)^{3k+1}$, then $k =$

(A) $r, r \in \mathbb{N}$
(B) $2r + 1, r \in \mathbb{N}$
(C) $4r + 1, r \in \mathbb{N}$
(D) $3r, r \in \mathbb{N}$

Answer: (A) $r, r \in \mathbb{N}$ · The council's preliminary key

Q168 AP EAPCET 2023 · 17 May · Shift 1 MCQ

If α, β are the two real roots of 4th roots of unity and γ, δ are the other two roots of it, then the sum of the eccentricities of the conics $|z - \alpha| + |z - \beta| = 4$ and $|z - \gamma| + |z - \delta| = 6$ is

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(A) $\frac{5}{6}$
(B) $\frac{5}{12}$
(C) $\frac{3}{7}$
(D) $\frac{4}{5}$

Answer: (A) $\frac{5}{6}$ · The council's preliminary key

Q169 AP EAPCET 2023 · 17 May · Shift 2 MCQ

The modulus of the conjugate of $z = \frac{-2+i}{(1-2i)^2}$ is

(A) $\frac{1}{5}$
(B) $\frac{1}{\sqrt{5}}$
(C) $\frac{1}{25}$
(D) $\sqrt{5}$

Answer: (B) $\frac{1}{\sqrt{5}}$ · The council's preliminary key

Q170 AP EAPCET 2023 · 17 May · Shift 2 MCQ

If $z_1 = 2+5i$, $z_2 = -1+4i$ and $z_3 = i$, then $\left|\frac{z_1 - z_3}{z_3 - z_2}\right| =$

(A) $\sqrt{2}$
(B) $2\sqrt{2}$
(C) $5\sqrt{2}$
(D) $4\sqrt{2}$

Answer: (A) $\sqrt{2}$ · The council's preliminary key

Q171 AP EAPCET 2023 · 17 May · Shift 2 MCQ

The locus of the variable point $z = x + iy$ whose amplitude is always equal to θ, is

(A) $x^2 + y^2 = \tan^2\theta$
(B) $y = x\tan\theta$
(C) $\frac{x^2}{\sin^2\theta} + \frac{y^2}{\cos^2\theta} = 1$
(D) $\frac{x^2}{\sin^2\theta} - \frac{y^2}{\cos^2\theta} = 1$

Answer: (B) $y = x\tan\theta$ · The council's preliminary key

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Q172 AP EAPCET 2023 · 17 May · Shift 2 MCQ

α is the real root and β, γ are the other roots of the equation $x^3 - a^3 = 0$ $(a > 0)$, then the number of common points of the curves given by $|z - \beta| = \frac{\sqrt{3}a}{2}$ and $|z - \gamma| = \frac{\sqrt{3}}{2}\alpha$ is

(A) 0
(B) 2
(C) 3
(D) 1

Answer: (D) 1 · The council's preliminary key

Q173 AP EAPCET 2023 · 16 May · Shift 1 MCQ

If $\sqrt{-3-4i} = re^{i\theta}$, then $r^2 \tan\theta =$

(A) -5
(B) 5
(C) 10
(D) -10

Answer: (D) -10 · The council's preliminary key

Q174 AP EAPCET 2023 · 16 May · Shift 1 MCQ

If ω is a complex cube root of unity, then $\cos\left(\sum_{k=1}^{7}(k-\omega)(k-\omega^2)\frac{\pi}{175}\right) =$

(A) -1
(B) 0
(C) 1
(D) 5

Answer: (A) -1 · The council's preliminary key

Q175 AP EAPCET 2023 · 16 May · Shift 1 MCQ

Let the two values of $z = \sqrt{\frac{1-i}{1+i}}$ be z_1 and z_2. If $-\frac{\pi}{2} < \text{Arg}(z_1) < \text{Arg}(z_2) < \pi$, then $\arg(z_1) + \arg(z_2) =$

(A) $\frac{\pi}{4}$
(B) $\frac{3\pi}{2}$
(C) $\frac{\pi}{3}$
(D) $\frac{\pi}{2}$

Answer: (D) $\frac{\pi}{2}$ · The council's preliminary key

Q176 AP EAPCET 2023 · 16 May · Shift 1 MCQ

If α and β are the roots of the equation $x^2+x+1=0$, then the quadratic equation whose roots are α^{2023} and β^{1012} is

(A) $x^2+x+1=0$
(B) $x^2-x+1=0$
(C) $x^2-x+2=0$
(D) $x^2+x+2=0$

Answer: (A) $x^2+x+1=0$ · The council's preliminary key

Q177 AP EAPCET 2023 · 16 May · Shift 2 MCQ

If C is a point on the straight line joining the points $A(-2+i)$ and $B(3-4i)$ in the Argand plane and $\frac{AC}{CB}=\frac{1}{2}$, then the argument of C is

(A) $\mathrm{Tan}^{-1}3$
(B) $\mathrm{Tan}^{-1}2-\pi$
(C) $\mathrm{Tan}^{-1}2$
(D) $\pi-\mathrm{Tan}^{-1}3$

Answer: (B) $\mathrm{Tan}^{-1}2-\pi$ · The council's preliminary key

Q178 AP EAPCET 2023 · 16 May · Shift 2 MCQ

If α is the modulus of $z_1=4+3i$, then a point that does not lie in the region represented by $|z-\overline{z_1}|\le\alpha$ is

(A) z_1-2i
(B) z_1
(C) $2z_1-7i$
(D) $3z_1-(10+8i)$

Answer: (B) z_1 · The council's preliminary key

Q179 AP EAPCET 2023 · 16 May · Shift 2 MCQ

If z_1,z_2,z_3 are the vertices of an equilateral triangle and z is its circum centre, then

(A) $\frac{|z-z_1|}{|z-z_2|}=\frac{|z-z_3|}{|z-z_1|}$
(B) $|z-z_1|+|z-z_2|+|z-z_3|=0$
(C) $\frac{|z-z_1|}{|z-z_2|}=|z-z_3|$
(D) $\frac{|z-z_1|+|z-z_2|}{|z-z_3|}=1$

Answer: (A) $\frac{|z-z_1|}{|z-z_2|}=\frac{|z-z_3|}{|z-z_1|}$ · The council's preliminary key

Q180 AP EAPCET 2023 · 15 May · Shift 1 MCQ

If $z_1 = (2, -1)$ and $z_2 = (6, 3)$, then $\text{amp}\left(\frac{z_1 - z_2}{z_1 + z_2}\right) =$

(A) $-\frac{3\pi}{4} - \text{Tan}^{-1}\left(\frac{1}{4}\right)$

(B) $\frac{\pi}{4} - \text{Tan}^{-1}\left(\frac{1}{4}\right)$

(C) $\frac{3\pi}{4} + \text{Tan}^{-1}\left(\frac{1}{4}\right)$

(D) $\frac{\pi}{4} + \text{Tan}^{-1}\left(\frac{1}{4}\right)$

Answer: (A) $-\frac{3\pi}{4} - \text{Tan}^{-1}\left(\frac{1}{4}\right)$ · The council's preliminary key

Q181 AP EAPCET 2023 · 15 May · Shift 1 MCQ

The number of all possible solutions of the equation $z^3 + \overline{z} = 0$ is

(A) 4

(B) 5

(C) 3

(D) 6

Answer: (B) 5 · The council's preliminary key

Q182 AP EAPCET 2023 · 15 May · Shift 1 MCQ

$\left[\sqrt{2}(\cos 56^\circ 15' + i \sin 56^\circ 15')\right]^8 =$

(A) 1

(B) i

(C) 16

(D) $16i$

Answer: (D) $16i$ · The council's preliminary key

Q183 AP EAPCET 2023 · 15 May · Shift 1 MCQ

$(1+i)^{2024} + (1-i)^{2024} =$

(A) -2^{1012}

(B) 2^{1013}

(C) $2^{2024}i$

(D) $-2^{1012}i$

Answer: (B) 2^{1013} · The council's preliminary key

Q184 AP EAPCET 2023 · 15 May · Shift 2 MCQ

$S = \{z \in C / |z - 1 + i| = 1\}$ represents

(A) a circle with centre $(-1, 1)$ and radius 1 unit

(B) a circle with centre $(1, 2)$ and radius 5 units

(C) a circle with centre $(1, -1)$ and radius 1 unit

(D) an ellipse with centre $(1, -1)$

Answer: (C) a circle with centre $(1, -1)$ and radius 1 unit · The council's preliminary key

Q185 AP EAPCET 2023 · 15 May · Shift 2 MCQ

If $\left|z - \frac{2}{z}\right| = 2$, then the greatest value of $|z|$ is

(A) $\sqrt{3} - 1$

(B) $\sqrt{3}$

(C) $\sqrt{3} + 1$

(D) $\sqrt{3} + 2$

Answer: (C) $\sqrt{3} + 1$ · The council's preliminary key

Q186 AP EAPCET 2023 · 15 May · Shift 2 MCQ

One of the 15th roots of -1 is

(A) $\text{cis}\, 0$

(B) $\text{cis}\, \frac{14\pi}{15}$

(C) $\text{cis}\, \frac{13\pi}{15}$

(D) $\text{cis}\, \frac{8\pi}{15}$

Answer: (C) $\text{cis}\, \frac{13\pi}{15}$ · The council's preliminary key

Q187 AP EAPCET 2023 · 15 May · Shift 2 MCQ

The product of the four values of $(1 + i\sqrt{3})^{3/4}$ is

(A) $-8i$

(B) i

(C) -8

(D) 8

Answer: (D) 8 · The council's preliminary key

Q188 TS EAMCET 2023 · 14 May · Shift 1 MCQ

If $i = \sqrt{-1}$ then $\sum_{n=0}^{\infty} \left(\frac{i}{3}\right)^n =$

(A) $\frac{9-3i}{10}$
(B) $9-3i$
(C) $9+3i$
(D) $\frac{9+3i}{10}$

Answer: (D) $\frac{9+3i}{10}$ · The council's preliminary key

Q189 TS EAMCET 2023 · 14 May · Shift 1 MCQ

If $i=\sqrt{-1}$ then $Arg\left[\frac{(1+i)^{2025}}{(1-i)^{2022}}\right]=$

(A) $\frac{-\pi}{4}$
(B) $\frac{\pi}{4}$
(C) $\frac{3\pi}{4}$
(D) $\frac{-3\pi}{4}$

Answer: (A) $\frac{-\pi}{4}$ · The council's preliminary key

Q190 TS EAMCET 2023 · 14 May · Shift 1 MCQ

The locus of z such that $\left|\frac{z-i}{z+i}\right|=2$, where $z=x+iy$, is

(A) $3x^2+3y^2+10y+3=0$
(B) $3x^2-3y^2-10y-3=0$
(C) $3x^2+3y^2+10y-3=0$
(D) $x^2+y^2-5y+3=0$

Answer: (A) $3x^2+3y^2+10y+3=0$ · The council's preliminary key

Q191 TS EAMCET 2023 · 14 May · Shift 1 MCQ

If $x_n=\cos\frac{\pi}{2^n}+i\sin\frac{\pi}{2^n}$, then $\prod_{n=1}^{\infty}x_n=$

(A) 0
(B) 1
(C) -1
(D) i

Answer: (C) -1 · The council's preliminary key

Q192 TS EAMCET 2023 · 14 May · Shift 1 MCQ

If the roots of the equation $z^2-i=0$ are α and β, then $|\operatorname{Arg}\beta-\operatorname{Arg}\alpha|=$

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(A) 2π
(B) $\frac{\pi}{2}$
(C) π
(D) $\frac{\pi}{4}$

Answer: (C) π · The council's preliminary key

Q193 TS EAMCET 2023 · 14 May · Shift 2 MCQ

If $x = a + b$, $y = a\alpha + b\beta$, $z = a\beta + b\alpha$ and α, β are the complex cube roots of unity, then $x^3 + y^3 + z^3 =$

(A) $a^3 + b^3$
(B) $3(a^3 + b^3)$
(C) $a^3 - b^3$
(D) $3(a^3 - b^3)$

Answer: (B) $3(a^3 + b^3)$ · The council's preliminary key

Q194 TS EAMCET 2023 · 14 May · Shift 2 MCQ

If $Z = \frac{3+2i\sin\theta}{1-2i\sin\theta}$ is a purely imaginary number, then $\sin^2\theta + \cos^2 3\theta =$

(A) $\frac{3}{4}$
(B) $\frac{7}{4}$
(C) 1
(D) $\frac{5}{4}$

Answer: (B) $\frac{7}{4}$ · The council's preliminary key

Q195 TS EAMCET 2023 · 14 May · Shift 2 MCQ

If $z = x + iy$ is a complex number such that $z\overline{z}^3 + \overline{z}z^3 = 350$ and x, y are integers, then $|z| =$

(A) $\sqrt{41}$
(B) 5
(C) 25
(D) $\sqrt{13}$

Answer: (B) 5 · The council's preliminary key

Q196 TS EAMCET 2023 · 14 May · Shift 2 MCQ

If α, β are the roots of the equation $x^2 + x + 1 = 0$, then $(\alpha + \beta)^2 + (\alpha^2 + \beta^2)^2 + (\alpha^3 + \beta^3)^2 + \ldots + (\alpha^{12} + \beta^{12})^2 =$

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(A) 48
(B) 12
(C) 24
(D) 36

Answer: (C) 24 · The council's preliminary key

Q197 TS EAMCET 2023 · 14 May · Shift 2 MCQ

The least positive integral value of n such that $\left[\frac{1+\sin\frac{2\pi}{9}+i\cos\frac{2\pi}{9}}{1+\sin\frac{2\pi}{9}-i\cos\frac{2\pi}{9}}\right]^n = 1$ is

(A) 9
(B) 18
(C) 36
(D) 72

Answer: (C) 36 · The council's preliminary key

Q198 TS EAMCET 2023 · 13 May · Shift 1 MCQ

If the value of $\sqrt{-5-12i}+\sqrt{7+24i}$ is a negative real number k, then $k =$

(A) -5
(B) -7
(C) -6
(D) -4

Answer: (C) -6 · The council's preliminary key

Q199 TS EAMCET 2023 · 13 May · Shift 1 MCQ

Let $z = x + iy$ be a point in the Argand plane. If the amplitude of $\left(\frac{z-3}{z+2i}\right)$ is $\frac{\pi}{2}$, then the locus of z is

(A) a circle
(B) a straight line
(C) a semicircular arc not containing the origin
(D) a semicircular arc containing the origin

Answer: (D) a semicircular arc containing the origin · The council's preliminary key

Q200 TS EAMCET 2023 · 13 May · Shift 1 MCQ

If a point P denotes the complex number $z = x + iy$ in the Argand plane and if $\frac{z-(2+i)}{z+(1-2i)}$ is purely real, then the locus of P is

(A) the line $x+3y-5=0$ excluding the point $(-1,2)$
(B) the circle $x^2+y^2-x-3y=0$ excluding the point $(-1,2)$
(C) the line $x+3y-5=0$ and the circle $x^2+y^2-x-3y=0$ excluding the point $(-1,2)$
(D) the circle $x^2+y^2-2x-6y+5=0$ excluding the point $(-1,2)$

Answer: (A) the line $x+3y-5=0$ excluding the point $(-1,2)$ · The council's preliminary key

Q201 TS EAMCET 2023 · 13 May · Shift 1 MCQ

If 'i' is the root of the equation $x^2+1=0$ then $(1+\sqrt{3}i)^{2023}+(1-\sqrt{3}i)^{2023}=$

(A) 2^{2022}
(B) 2^{2023}
(C) $2^{2022}(\sqrt{3})$
(D) $2^{2023}(\sqrt{3})$

Answer: (B) 2^{2023} · The council's preliminary key

Q202 TS EAMCET 2023 · 13 May · Shift 1 MCQ

One of the values of $(\sqrt{3}-i)^{\frac{1}{6}}$ is

(A) $2^{\frac{1}{6}}\text{cis}\dfrac{61\pi}{36}$
(B) $2^{\frac{1}{6}}\text{cis}\dfrac{37\pi}{36}$
(C) $2^{\frac{1}{6}}\text{cis}\dfrac{59\pi}{36}$
(D) $2^{\frac{1}{6}}\text{cis}\dfrac{49\pi}{36}$

Answer: (C) $2^{\frac{1}{6}}\text{cis}\dfrac{59\pi}{36}$ · The council's preliminary key

Q203 TS EAMCET 2023 · 13 May · Shift 2 MCQ

If $i^2=-1$ then $(1+\sqrt{3}i)^{2022}-(\sqrt{3}-i)^{2022}=$

(A) 2^{2023}
(B) 0
(C) 2^{2022}
(D) 3^{1011}

Answer: (A) 2^{2023} · The council's preliminary key

Q204 TS EAMCET 2023 · 13 May · Shift 2 MCQ

If $\left(\frac{\sqrt{3}+i}{\sqrt{3}-i}\right)^4+\left(\frac{\sqrt{3}-i}{\sqrt{3}+i}\right)^4=r\ cis\ \theta$, then one of the values of $\sqrt{r\ cis\theta}$ is

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(A) $cis\left(\frac{3\pi}{4}\right)$
(B) $cis\left(\frac{3\pi}{2}\right)$
(C) $cis\left(\frac{\pi}{3}\right)$
(D) $cis\ \pi$

Answer: (B) $cis\left(\frac{3\pi}{2}\right)$ · The council's preliminary key

Q205 TS EAMCET 2023 · 13 May · Shift 2 MCQ

If $z = x + iy$ and the point P in the Argand plane represents z, then the locus of z satisfying the equation $|z - 2| + |z - 2i| = 4$ is

(A) $4x^2 + 3xy + 4y^2 - 6x - 6y + 8 = 0$
(B) $3x^2 + 2xy + 3y^2 - 8x - 8y + 6 = 0$
(C) $3x^2 + 2xy + 3y^2 - 8x - 8y = 0$
(D) $4x^2 + 3xy + 4y^2 - 6x - 6y = 0$

Answer: (C) $3x^2 + 2xy + 3y^2 - 8x - 8y = 0$ · The council's preliminary key

Q206 TS EAMCET 2023 · 13 May · Shift 2 MCQ

One of the values of $(\sqrt{3} - i)^{\frac{2}{5}}$ is

(A) $2^{\frac{2}{5}}(1 - \sqrt{3}\,i)$
(B) $2^{\frac{-3}{5}}(\sqrt{3} + i)$
(C) $2^{\frac{2}{5}}(\sqrt{3} - i)$
(D) $2^{\frac{-3}{5}}(1 + \sqrt{3}\,i)$

Answer: (D) $2^{\frac{-3}{5}}(1 + \sqrt{3}\,i)$ · The council's preliminary key

Q207 TS EAMCET 2023 · 13 May · Shift 2 MCQ

If $\alpha, \beta, \gamma, \delta$ are the roots of the equation $x^4 + x^2 + 1 = 0$ such that $\alpha + \beta = -1$, $\gamma + \delta = 1$, $\alpha^2 = \beta$ and $\gamma^2 = -\delta$, then $\alpha^{2023} + \beta^{2023} + \gamma^{2022} + \delta^{2022} =$

(A) 1
(B) 0
(C) $1 + 3\omega$
(D) $\omega - 2\omega^2$

Answer: (A) 1 · The council's preliminary key

Q208 TS EAMCET 2023 · 12 May · Shift 1 MCQ

If z_1 and z_2 are complex numbers such that $|z_1 + z_2| = |z_1| + |z_2|$ then the difference in the amplitudes of z_1 and z_2 is

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(A) $\frac{\pi}{4}$
(B) $\frac{\pi}{3}$
(C) $\frac{\pi}{2}$
(D) 0

Answer: (D) 0 · The council's preliminary key

Q209 TS EAMCET 2023 · 12 May · Shift 1 MCQ

If $i = \sqrt{-1}$ then $1 + i^2 + i^4 + i^6 + \ldots + i^{2024} =$

(A) i
(B) $-i$
(C) 1
(D) -1

Answer: (C) 1 · The council's preliminary key

Q210 TS EAMCET 2023 · 12 May · Shift 1 MCQ

If $\frac{1+i\cos\theta}{1-2i\cos\theta}$ is purely real then $\cos^3\theta + \sin^2\theta + \cos\theta + 1 =$

(A) 0
(B) 1
(C) 2
(D) $\frac{3}{4}(2+\sqrt{2})$

Answer: (C) 2 · The council's preliminary key

Q211 TS EAMCET 2023 · 12 May · Shift 1 MCQ

If $\theta = \frac{\pi}{6}$, then the 10th term of the series $1 + (\cos\theta + i\sin\theta)^1 + (\cos\theta + i\sin\theta)^2 + \ldots$ is

(A) -1
(B) $-i$
(C) $\frac{1}{2} + \frac{\sqrt{3}i}{2}$
(D) 1

Answer: (B) $-i$ · The council's preliminary key

Q212 TS EAMCET 2023 · 12 May · Shift 1 MCQ

If α, β are non-zero integers and $z = (\alpha + i\beta)(2 + 7i)$ is a purely imaginary number, then minimum value of $|z|^2$ is

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(A) 0
(B) 2809
(C) 2808
(D) 1

Answer: (B) 2809 · The council's preliminary key

Q213 TS EAMCET 2023 · 12 May · Shift 2 MCQ

$\text{Arg}\left(\sin\frac{6\pi}{5}+i\left(1+\cos\frac{6\pi}{5}\right)\right)=$

(A) $\frac{5\pi}{6}$
(B) $\frac{6\pi}{5}$
(C) $\frac{2\pi}{5}$
(D) $\frac{9\pi}{10}$

Answer: (D) $\frac{9\pi}{10}$ · The council's preliminary key

Q214 TS EAMCET 2023 · 12 May · Shift 2 MCQ

If $x+iy=\sqrt{\frac{3+i}{1+3i}}$, then $\left(x^2+y^2\right)^2=$

(A) 0
(B) 1
(C) 2
(D) 3

Answer: (B) 1 · The council's preliminary key

Q215 TS EAMCET 2023 · 12 May · Shift 2 MCQ

If the imaginary part of $\frac{2z+1}{iz+1}$ is -2, then the locus of the point representing z in the Argand plane is

(A) a circle
(B) a straight line
(C) a parabola
(D) an ellipse

Answer: (B) a straight line · The council's preliminary key

Q216 TS EAMCET 2023 · 12 May · Shift 2 MCQ

If $i=\sqrt{-1}$, then $(1+i)^{10}+(1-i)^{10}=$

(A) -64
(B) 64
(C) 0
(D) $64i$

Answer: (C) 0 · The council's preliminary key

Q217 TS EAMCET 2023 · 12 May · Shift 2 MCQ

If α and β are the roots of the equation $x^2+2x+2=0$, then $\alpha^{15}+\beta^{15}=$

(A) -512
(B) -256
(C) 256
(D) 512

Answer: (B) -256 · The council's preliminary key

Q218 TS EAMCET 2022 · 20 Jul · Shift 1 MCQ

$\{x \in [0,2\pi] / \sin x + i\cos 2x$ and $\cos x - i\sin 2x$ are conjugate to each other$\} =$

(A) $\left\{\frac{\pi}{4}, \frac{\pi}{2}, \frac{3\pi}{4}, \pi, \frac{5\pi}{4}, \frac{3\pi}{2}, \frac{7\pi}{4}, 2\pi\right\}$
(B) $\left\{\frac{\pi}{4}, \frac{3\pi}{4}, \frac{5\pi}{4}, \frac{7\pi}{4}\right\}$
(C) $\left\{\frac{\pi}{2}, \pi, \frac{3\pi}{2}, 2\pi\right\}$
(D) ϕ

Answer: (D) ϕ · The council's preliminary key

Q219 TS EAMCET 2022 · 20 Jul · Shift 1 MCQ

If $|x+iy| = \sqrt{x^2+y^2}$, then $\left|(1-\sqrt{3}\,i)^9 + (\sqrt{3}+i)^9\right| =$

(A) 2^9
(B) 2^{18}
(C) 2^{10}
(D) $2^{\frac{19}{2}}$

Answer: (D) $2^{\frac{19}{2}}$ · The council's preliminary key

Q220 TS EAMCET 2022 · 20 Jul · Shift 1 MCQ

If $1, \omega, \omega^2$ are the cube roots of unity and $1, \alpha, \alpha^2, \alpha^3$ are the fourth roots of unity in usual notation then $\alpha + \alpha\omega - \alpha^3\omega^2 =$

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(A) 3
(B) 1
(C) 0
(D) -1

Answer: (C) 0 · The council's preliminary key

Q221 TS EAMCET 2022 · 20 Jul · Shift 2 MCQ

If α, β are the roots of the equation $x^2 - 2x + 2 = 0$ then $\alpha^{2020} + \beta^{2020} =$

(A) 2^{1011}
(B) -2^{1011}
(C) 2^{2021}
(D) 2^{-2021}

Answer: (B) -2^{1011} · The council's preliminary key

Q222 TS EAMCET 2022 · 20 Jul · Shift 2 MCQ

If $z = \dfrac{-1 - i\sqrt{3}}{2}$, then $\displaystyle\sum_{k=1}^{2022} \left(z^k + \frac{1}{z^k}\right)^2 =$

(A) 0
(B) 2022
(C) 4044
(D) 1011

Answer: (C) 4044 · The council's preliminary key

Q223 TS EAMCET 2022 · 19 Jul · Shift 1 MCQ

If $(2x - y + 1) + i(x - 2y - 1) = 2 - 3i$, then the multiplicative inverse of $(x - iy)$ is

(A) $\dfrac{15}{41} + \dfrac{12}{41}i$
(B) $\dfrac{6}{29} + \dfrac{15}{29}i$
(C) $\dfrac{15}{29} + \dfrac{6}{29}i$
(D) $\dfrac{12}{41} + \dfrac{15}{41}i$

Answer: (D) $\dfrac{12}{41} + \dfrac{15}{41}i$ · The council's preliminary key

Q224 TS EAMCET 2022 · 19 Jul · Shift 1 MCQ

If $\operatorname{cis}\alpha$ is the common value of $(-1)^{1/4}$ and $(-i)^{1/2}$ then $\tan\alpha =$

(A) -1
(B) 1
(C) $\sqrt{3}$
(D) $\frac{1}{\sqrt{3}}$

Answer: (A) -1 · The council's preliminary key

Q225 TS EAMCET 2022 · 19 Jul · Shift 2 MCQ

If $Z = \alpha + i\beta$ satisfies the equation $|Z| - Z = 1 + 2i$ and $|Z| = \sqrt{\alpha^2 + \beta^2}$ then $Z\overline{Z} =$

(A) $\frac{5}{2}$
(B) $\frac{25}{4}$
(C) $\frac{16}{9}$
(D) $\frac{36}{25}$

Answer: (B) $\frac{25}{4}$ · The council's preliminary key

Q226 TS EAMCET 2022 · 19 Jul · Shift 2 MCQ

If $1, \alpha_1, \alpha_2, \alpha_3, \ldots, \alpha_{n-1}$ are n^{th} roots of unity then $\sum_{1 \le i < j \le n-1} \alpha_i \alpha_j =$

(A) 1
(B) 0
(C) -1
(D) i

Answer: (A) 1 · The council's preliminary key

Q227 TS EAMCET 2022 · 18 Jul · Shift 1 MCQ

$\sqrt{(-3+4i)(8+6i)} =$

(A) $\pm(1+2i)$
(B) $\pm(3+i)$
(C) $\pm(1+7i)$
(D) $\pm(7-i)$

Answer: (C) $\pm(1+7i)$ · The council's preliminary key

Q228 TS EAMCET 2022 · 18 Jul · Shift 1 MCQ

If $\left(\frac{\sqrt{3}+i}{\sqrt{3}-i}\right)^m = 1,\ 2022 < m < 2029$, then $m =$

(A) 2022
(B) 2024
(C) 2028
(D) 2026

Answer: (C) 2028 · The council's preliminary key

Q229 TS EAMCET 2022 · 18 Jul · Shift 1 MCQ

If $1, \omega, \omega^2$ are the cube roots of unity, $n \in \mathbb{N}$ and $n > 2$ then the least value of n such that $1 + \omega$ is a root of $x^n - x = 0$ is

(A) 3
(B) 5
(C) 7
(D) 4

Answer: (C) 7 · The council's preliminary key

Q230 TS EAMCET 2022 · 18 Jul · Shift 2 MCQ

If the point (x, y) satisfies the equation $\frac{x+i(x-2)}{3+i} - i = \frac{2y+i(1-3y)}{i-3}$, then $x + y =$

(A) 4
(B) 2
(C) 0
(D) -2

Answer: (B) 2 · The council's preliminary key

Q231 TS EAMCET 2022 · 18 Jul · Shift 2 MCQ

If $\cos\alpha + \cos\beta + \cos\gamma = 0$ and $\sin\alpha + \sin\beta + \sin\gamma = 0$ then $\cos 2\alpha + \cos 2\beta + \cos 2\gamma =$

(A) $\frac{3}{2}$
(B) $\cos^2\frac{\alpha}{2} + \cos^2\frac{\beta}{2} + \cos^2\frac{\gamma}{2}$
(C) $3\sin(\alpha + \beta + \gamma)$
(D) $\cos(\alpha + \beta) + \cos(\beta + \gamma) + \cos(\gamma + \alpha)$

Answer: (D) $\cos(\alpha + \beta) + \cos(\beta + \gamma) + \cos(\gamma + \alpha)$ · The council's preliminary key

Q232 TS EAMCET 2022 · 18 Jul · Shift 2 MCQ

One of the values of $(-32i)^{\frac{2}{5}}$ is

(A) $4\,cis\,\frac{2\pi}{5}$
(B) $4\,cis\,\frac{3\pi}{5}$
(C) $4\,cis\,\frac{4\pi}{5}$
(D) $4\,cis\,\frac{6\pi}{5}$

Answer: (B) $4\,cis\,\frac{3\pi}{5}$ · The council's preliminary key

Q233 AP EAPCET 2022 · 8 Jul · Shift 1 MCQ

Area of the triangle formed by the complex numbers z, iz and $z+iz$ in the Argand diagram as vertices is

(A) $\frac{1}{2}\cdot|z|^2$
(B) $\frac{1}{2}\cdot z^2$
(C) z^2
(D) $|z|^2$

Answer: (A) $\frac{1}{2}\cdot|z|^2$ · The council's preliminary key

Q234 AP EAPCET 2022 · 8 Jul · Shift 1 MCQ

If the $\operatorname{Arg} z_1$ and $\operatorname{Arg}\overline{z_2}$ are $\frac{\pi}{3}$ and $\frac{\pi}{5}$ respectively then the value of $\operatorname{Arg} z_1+\operatorname{Arg} z_2$ is

(A) $11\pi/15$
(B) $6\pi/15$
(C) $2\pi/15$
(D) $8\pi/15$

Answer: (C) $2\pi/15$ · The council's preliminary key

Q235 AP EAPCET 2022 · 8 Jul · Shift 1 MCQ

$\left(\frac{1-i}{1+i}\right)^{2022}+\left(\frac{1+i}{1-i}\right)^{2021}=$

(A) $-i$
(B) i
(C) $i+1$
(D) $i-1$

Answer: (D) $i-1$ · The council's preliminary key

Q236 AP EAPCET 2022 · 8 Jul · Shift 1 MCQ

If $1,\omega,\omega^2$ are the cube roots of unity then the value of $(x+y)^2+(x\omega+y\omega^2)^2+(x\omega^2+y\omega)^2$ is

(A) $2x^2 \cdot 3y^2$
(B) $4xy$
(C) $6xy$
(D) $2x^2 \cdot 2y^2$

Answer: (C) $6xy$ · The council's preliminary key

Q237 AP EAPCET 2022 · 8 Jul · Shift 2 MCQ

If $(x - iy)^{1/3} = 2 - i\sqrt{3}$ and the point $z = (x, y)$ lies on the line $\frac{x}{2} + \frac{y}{\sqrt{3}} = k$, then $k =$

(A) 16
(B) 2
(C) 8
(D) 4

Answer: (D) 4 · The council's preliminary key

Q238 AP EAPCET 2022 · 8 Jul · Shift 2 MCQ

If $\left|z + \frac{2}{z}\right| = 2$, then the maximum value of $|z|$ is

(A) $\sqrt{3} + 1$
(B) $\sqrt{3} - 1$
(C) $\sqrt{3}$
(D) infinity

Answer: (A) $\sqrt{3} + 1$ · The council's preliminary key

Q239 AP EAPCET 2022 · 8 Jul · Shift 2 MCQ

A complex number z among the following which does not satisfy $z^3 - 27i = 0$ is

(A) $(3\sqrt{3} - 3i)/2$
(B) $-3i$
(C) $(3\sqrt{3} + 3i)/2$
(D) $(-3\sqrt{3} + 3i)/2$

Answer: (A) $(3\sqrt{3} - 3i)/2$ · The council's preliminary key

Q240 AP EAPCET 2022 · 8 Jul · Shift 2 MCQ

If $|z - 3i| + |z + 5i| = 4$, then the locus of z is

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(A) No such point z exists
(B) Ellipse
(C) Parabola
(D) Circle

Answer: (A) No such point z exists · The council's preliminary key

Q241 AP EAPCET 2022 · 7 Jul · Shift 1 MCQ

Let z and w be two complex numbers such that $\bar{z} + i\bar{w} = 0$ and $\text{Arg}(zw) = \pi$. Then $\text{Arg}\, z =$

(A) $3\pi/4$
(B) $\pi/2$
(C) $5\pi/4$
(D) $\pi/4$

Answer: (A) $3\pi/4$ · The council's preliminary key

Q242 AP EAPCET 2022 · 7 Jul · Shift 1 MCQ

If the complex number z_1, z_2, 0 are vertices of an equilateral triangle, then $z_1^2 + z_2^2 =$

(A) $2z_1^2 z_2^2$
(B) $z_1^2 z_2^2$
(C) $2z_1 z_2$
(D) $z_1 z_2$

Answer: (D) $z_1 z_2$ · The council's preliminary key

Q243 AP EAPCET 2022 · 7 Jul · Shift 1 MCQ

Let $z = x + iy$ be a complex number with $x, y \in \mathbb{Z}$. Then the area (in square units) of the rectangle whose vertices are the roots of the equation $\bar{z} \cdot z^3 + z \cdot \bar{z}^3 = 350$ is

(A) 48
(B) 32
(C) 40
(D) 44

Answer: (A) 48 · The council's preliminary key

Q244 AP EAPCET 2022 · 7 Jul · Shift 1 MCQ

If $1, \omega, \omega^2$ are the cube roots of unity, then $(2-\omega)^2(2-\omega^2)^2(2-\omega^{10})^2(2-\omega^{11})^2 =$

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(A) -7^4

(B) 7^4

(C) 7^8

(D) -7^8

Answer: (B) 7^4 · The council's preliminary key

Q245 AP EAPCET 2022 · 7 Jul · Shift 2 MCQ

$\frac{(1+i)x-2i}{3+i}+\frac{(2-3i)y+i}{3-i}=i \Rightarrow x+y=$

(A) -1

(B) 1

(C) -2

(D) 2

Answer: (D) 2 · The council's preliminary key

Q246 AP EAPCET 2022 · 7 Jul · Shift 2 MCQ

Let z and w be two distinct non-zero complex numbers if $|z|^2w-|w|^2z=z-w$, then

(A) $w=\bar{z}^2$

(B) $z\overline{w}=2$

(C) $z\overline{w}=1$

(D) $w=\bar{z}$

Answer: (C) $z\overline{w}=1$ · The council's preliminary key

Q247 AP EAPCET 2022 · 7 Jul · Shift 2 MCQ

If $1,\omega,\omega^2$ denote the cube roots of unity, then, the value of $(1-\omega+\omega^2)^5+(1+\omega-\omega^2)^5$ is

(A) $32\,\omega^2$

(B) $32\,\omega$

(C) -32

(D) 32

Answer: (D) 32 · The council's preliminary key

Q248 AP EAPCET 2022 · 7 Jul · Shift 2 MCQ

The values of θ, for which $\frac{3+2i\sin\theta}{1-2i\sin\theta}$ is real are

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(A) $\theta = n\pi + \frac{\pi}{3}$ for $n \in \mathbb{Z}$
(B) $\theta = n\pi + \frac{\pi}{4}$ for $n \in \mathbb{Z}$
(C) $\theta = n\pi + \frac{\pi}{2}$ for $n \in \mathbb{Z}$
(D) $\theta = n\pi$ for $n \in \mathbb{Z}$

Answer: (D) $\theta = n\pi$ for $n \in \mathbb{Z}$ · The council's preliminary key

Q249 AP EAPCET 2022 · 6 Jul · Shift 1 MCQ

If $(x + iy) = \left(\frac{1+i}{1-i}\right)^3 - \left(\frac{1-i}{1+i}\right)^3$, then the true statement among the following is

(A) $x < y$
(B) $x > y$
(C) $x \neq 0$
(D) $x = y$

Answer: (B) $x > y$ · The council's preliminary key

Q250 AP EAPCET 2022 · 6 Jul · Shift 1 MCQ

The number of complex numbers z satisfying $\bar{z} = iz^2$ is

(A) 3
(B) 4
(C) 2
(D) 5

Answer: (B) 4 · The council's preliminary key

Q251 AP EAPCET 2022 · 6 Jul · Shift 1 MCQ

The number of distinct solutions of the equation $x^{11} - x^7 + x^4 - 1 = 0$ is

(A) 9
(B) 11
(C) 10
(D) 8

Answer: (C) 10 · The council's preliminary key

Q252 AP EAPCET 2022 · 6 Jul · Shift 1 MCQ

$z = \cos\theta + i\sin\theta \Rightarrow z^r + (\bar{z})^r =$

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(A) $\cos r\theta$
(B) $2\cos r\theta$
(C) $\sin r\theta$
(D) $2\sin r\theta$

Answer: (B) $2\cos r\theta$ · The council's preliminary key

Q253 AP EAPCET 2022 · 6 Jul · Shift 2 MCQ

$(-1+i\sqrt{3})^{60} =$

(A) 2^{60}
(B) 2^{59}
(C) 2^{61}
(D) 2^{30}

Answer: (A) 2^{60} · The council's preliminary key

Q254 AP EAPCET 2022 · 6 Jul · Shift 2 MCQ

For any complex number z, the minimum value of $|z|+|z-1|$ is

(A) 1
(B) 0
(C) $1/2$
(D) $3/2$

Answer: (A) 1 · The council's preliminary key

Q255 AP EAPCET 2022 · 6 Jul · Shift 2 MCQ

If the vertices A, B and C of an isosceles triangle ABC are respectively z_1, z_2 and z_3 and if $\angle C = 90^0$, then

(A) $(z_1-z_2)=(z_1-z_3)(z_3-z_2)$
(B) $(z_1-z_2)^2=(z_1-z_3)(z_3-z_2)$
(C) $(z_1-z_2)^2=2(z_1-z_3)(z_3-z_2)$
(D) $z_1^2+z_2^2+z_3^2=z_1z_2z_3+2$

Answer: (C) $(z_1-z_2)^2=2(z_1-z_3)(z_3-z_2)$ · The council's preliminary key

Q256 AP EAPCET 2022 · 6 Jul · Shift 2 MCQ

If $\alpha_1,\alpha_2,\ldots\ldots\ldots\alpha_{23}$ are the 23rd roots of unity, then $\alpha_1^{47}+\alpha_2^{47}+\cdots\ldots+\alpha_{23}^{47}=$

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(A) 23
(B) -1
(C) 1
(D) 0

Answer: (D) 0 · The council's preliminary key

Q257 AP EAPCET 2022 · 5 Jul · Shift 1 MCQ

By simplifying $i^{18} - 3i^7 + i^2(1 + i^4)(i)^{22}$ we get

(A) $-1 + 3i$
(B) $1 - 3i$
(C) $1 + 3i$
(D) $-1 - 3i$

Answer: (C) $1 + 3i$ · The council's preliminary key

Q258 AP EAPCET 2022 · 5 Jul · Shift 1 MCQ

The values of x for which $\sin x + i \cos 2x$ and $\cos x - i \sin 2x$ are conjugate to each other are

(A) $x = n\pi \pm \frac{\pi}{6}$
(B) None
(C) $x = n\pi \pm \frac{\pi}{3}$
(D) $x = \left(n + \frac{1}{2}\right)\pi$

Answer: (B) None · The council's preliminary key

Q259 AP EAPCET 2022 · 5 Jul · Shift 1 MCQ

The locus of a point z satisfying $|z|^2 = \mathrm{Re}(z)$ is a circle with centre

(A) $\left(0, \frac{1}{2}\right)$
(B) $\left(-\frac{1}{2}, 0\right)$
(C) $\left(\frac{1}{2}, 0\right)$
(D) $\left(0, -\frac{1}{2}\right)$

Answer: (C) $\left(\frac{1}{2}, 0\right)$ · The council's preliminary key

Q260 AP EAPCET 2022 · 5 Jul · Shift 2 MCQ

$\sum_{k=1}^{6} \sin\left(\frac{2\pi k}{7}\right) - i\cos\left(\frac{2\pi k}{7}\right) =$

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(A) 1
(B) $-i$
(C) i
(D) -1

Answer: (C) i · The council's preliminary key

Q261 AP EAPCET 2022 · 5 Jul · Shift 2 MCQ

If $(x-iy)^{1/3}=a-ib$, then the value of $\frac{x}{2a}+\frac{y}{2b}$ is

(A) $2(a^2-b^2)$
(B) $4(a^2-b^2)$
(C) a^2-b^2
(D) $\frac{1}{2}(a^2-b^2)$

Answer: (A) $2(a^2-b^2)$ · The council's preliminary key

Q262 AP EAPCET 2022 · 4 Jul · Shift 1 MCQ

$iz^3+z^2-z+i=0 \Rightarrow |z|=$

(A) 1/2
(B) 2
(C) 3/2
(D) 1

Answer: (D) 1 · The council's preliminary key

Q263 AP EAPCET 2022 · 4 Jul · Shift 1 MCQ

If $\frac{x-1}{3+i}+\frac{y-1}{3-i}=i$ then the true statement among the following is

(A) x < 0, y < 0
(B) x < 0, y > 0
(C) x > 0, y < 0
(D) x > 0, y < 0

Answer: (B) x < 0, y > 0 · The council's preliminary key

Q264 AP EAPCET 2022 · 4 Jul · Shift 1 MCQ

The number of integer solutions of the equation $|1-i|^x=2^x$ is

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(A) 1
(B) 0
(C) 2
(D) 3

Answer: (A) 1 · The council's preliminary key

Q265 AP EAPCET 2022 · 4 Jul · Shift 2 MCQ

Multiplicative inverse of the complex number $(\sin\theta, \cos\theta)$ is

(A) $(+\sin\theta, +\cos\theta)$
(B) $(\sin\theta, -\cos\theta)$
(C) $(\cos\theta, -\sin\theta)$
(D) $(-\cos\theta, \sin\theta)$

Answer: (B) $(\sin\theta, -\cos\theta)$ · The council's preliminary key

Q266 AP EAPCET 2022 · 4 Jul · Shift 2 MCQ

$\sum_{k=0}^{440} i^k = x + iy \Rightarrow x^{100} + x^{99}y + x^{242}y^2 + x^{97}y^3 =$

(A) 0
(B) -4
(C) 4
(D) 1

Answer: (D) 1 · The council's preliminary key

Q267 AP EAPCET 2022 · 4 Jul · Shift 2 MCQ

If $e^{i\theta} = \text{cis}\,\theta$ then $\sum_{n=0}^{\infty} \frac{\cos(n\theta)}{2^n} =$

(A) $(4 + 2\cos\theta)/(5 - 4\cos\theta)$
(B) $(4 - 2\cos\theta)/(5 + 4\cos\theta)$
(C) $(4 - 2\cos\theta)/(5 - 4\cos\theta)$
(D) $(4 + 2\cos\theta)/(5 + 4\cos\theta)$

Answer: (C) $(4 - 2\cos\theta)/(5 - 4\cos\theta)$ · The council's preliminary key

Q268 AP EAPCET 2021 · 5 Oct · Shift 1 MCQ

If x and y are real numbers such that $x + iy = \sqrt{\frac{(5-3i)(1+i)}{(6+2i)(2-i)}}$ then $(x^2+y^2)^2 =$

(A) $\frac{17}{50}$
(B) $\frac{40}{17}$
(C) $\frac{50}{17}$
(D) $\frac{17}{40}$

Answer: (A) $\frac{17}{50}$ · The council's preliminary key

Q269 AP EAPCET 2021 · 5 Oct · Shift 1 MCQ

The principal amplitude of $(\sin 40^\circ + i \cos 40^\circ)^5$ is

(A) 70°
(B) -110°
(C) 110°
(D) -70°

Answer: (B) -110° · The council's preliminary key

Q270 AP EAPCET 2021 · 5 Oct · Shift 1 MCQ

If $z = \text{cis}\,\frac{2\pi}{5}$ then $(1-z^4)(1-z^3)(1-z^2)(1-z) =$

(A) 2
(B) 5
(C) 4
(D) 3

Answer: (B) 5 · The council's preliminary key

Q271 AP EAPCET 2021 · 5 Oct · Shift 1 MCQ

If $f(x)$ is a polynomial with real coefficients and 'a' is a complex number, then $\overline{f(\alpha)}$ is equal to

(A) $[f(\alpha)]^2$
(B) $f(\alpha)$
(C) $\frac{1}{f(\alpha)}$
(D) $f(\bar{\alpha})$

Answer: (D) $f(\bar{\alpha})$ · The council's preliminary key

Q272 AP EAPCET 2021 · 25 Aug · Shift 1 MCQ

Define $f : C \to R$ by $f(z) = |z| \ \forall\ z \in C$. Then which of the following is false?

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(A) $f(-z) = f(z) \forall z \in C$

(B) $f(\bar{z}) = f(z) \forall z \in C$

(C) $f(z^2) = (f(z))^2 \forall z \in C$

(D) $f(z_1^2 + z_2^2) = f(z_1^2) + f(z_2^2) \forall z_1, z_2 \in C$

Answer: (D) $f(z_1^2 + z_2^2) = f(z_1^2) + f(z_2^2) \forall z_1, z_2 \in C$ · The council's preliminary key

Q273 AP EAPCET 2021 · 25 Aug · Shift 1 MCQ

The value of $\left\{ i^{22} - \left(\frac{1}{i}\right)^{35} \right\}^2$ is

(A) $2i$

(B) i

(C) $-i$

(D) $-2i$

Answer: (A) $2i$ · The council's preliminary key

Q274 AP EAPCET 2021 · 25 Aug · Shift 1 MCQ

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

(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) $2^{2n} \cos \frac{n\pi}{3}$

Answer: (C) $2^{n+1} \cos \frac{n\pi}{3}$ · The council's preliminary key

Q275 AP EAPCET 2021 · 25 Aug · Shift 1 MCQ

Let $1, \omega, \omega^2$ be the cube roots of unity. What is the value of $(1 - \omega + \omega^{-1})^5 - 2(1 + \omega - \omega^{-1})^4 =$?

(A) -64ω

(B) 64ω

(C) $-64\omega^{-1}$

(D) $64\omega^{-1}$

Answer: (C) $-64\omega^{-1}$ · The council's preliminary key

Q276 AP EAPCET 2021 · 25 Aug · Shift 2 MCQ

Which of the following is a fourth root of $\frac{1}{2} + \frac{i\sqrt{3}}{2}$?

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(A) $\text{cis}\,\frac{\pi}{12}$
(B) $\text{cis}\,\frac{\pi}{2}$
(C) $\text{cis}\,\frac{\pi}{6}$
(D) $\text{cis}\,\frac{\pi}{3}$

Answer: (A) $\text{cis}\,\frac{\pi}{12}$ · The council's preliminary key

Q277 AP EAPCET 2021 · 25 Aug · Shift 2 MCQ

If $1, \omega, \omega^2, \ldots \omega^{10}$ are 11th roots of unity, then product of these roots is '1'

(A) ω
(B) -1
(C) 1
(D) ω^2

Answer: (C) 1 · The council's preliminary key

Q278 AP EAPCET 2021 · 24 Aug · Shift 1 MCQ

If z is a complex number, the curves $|z| = 1, |z-2| = 1$ and $|z-1| = 0$ have a common point at

(A) $(0, 1)$
(B) $(2, 0)$
(C) $(1, 0)$
(D) $(0, 2)$

Answer: (C) $(1, 0)$ · The council's preliminary key

Q279 AP EAPCET 2021 · 24 Aug · Shift 1 MCQ

Let $z = x + iy$ be a complex number $(x, y \in R)$. Let A and B be two sets such that $A = \{z : |z| \leq 2\}$ and $B = \{z : (z + 2y) + \bar{z} \geq 4\}$ the are of region $A \cap B$ is

(A) 4
(B) $\pi - 4$
(C) π
(D) $\pi - 2$

Answer: (D) $\pi - 2$ · The council's preliminary key

Q280 AP EAPCET 2021 · 24 Aug · Shift 1 MCQ

If α and β are the roots of the equation $x^2 - x + 1 = 0$ then $\alpha^{2009} + \beta^{2009} =$

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(A) -2
(B) -1
(C) 1
(D) 2

Answer: (C) 1 · The council's preliminary key

Q281 AP EAPCET 2021 · 24 Aug · Shift 2 MCQ

$$\left|\frac{1}{i^{2020}}+\frac{2}{i^{2021}}+\frac{3}{i^{2022}}+\frac{4}{i^{2023}}\right| =$$

(A) $3\sqrt{2}$
(B) $4\sqrt{2}$
(C) $2\sqrt{2}$
(D) $\sqrt{2}$

Answer: (C) $2\sqrt{2}$ · The council's preliminary key

Q282 AP EAPCET 2021 · 24 Aug · Shift 2 MCQ

What is the product of all the values of $(1-i)^{\frac{2}{5}} =$

(A) $-2i$
(B) $2i$
(C) -2
(D) 2

Answer: (A) $-2i$ · The council's preliminary key

Q283 AP EAPCET 2021 · 23 Aug · Shift 1 MCQ

If $z \in C$, then the minimum value of $|z|+|2z-3|+|z-1|$ is

(A) 2
(B) 1
(C) 3
(D) 0

Answer: (A) 2 · The council's preliminary key

Q284 AP EAPCET 2021 · 23 Aug · Shift 1 MCQ

If $a, b \in R$ and $i=\sqrt{-1}$, then the number of ordered pairs of real numbers (a, b) satisfying the condition $(a+bi)^3 = a-bi$ is _____

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(A) 3
(B) 2
(C) 4
(D) 5

Answer: (D) 5 · Checked by our team

Q285 AP EAPCET 2021 · 23 Aug · Shift 1 MCQ

$\frac{\left(\sin\frac{\pi}{8}+i\cos\frac{\pi}{8}\right)^8}{\left(\sin\frac{\pi}{8}-i\cos\frac{\pi}{8}\right)^8} =$

(A) i
(B) $-i$
(C) 1
(D) 2

Answer: (C) 1 · The council's preliminary key

Q286 AP EAPCET 2021 · 23 Aug · Shift 1 MCQ

If $z^2+z+1=0$ where z is a complex number, then $\left(z+\frac{1}{z}\right)^3+\left(z^4+\frac{1}{z^4}\right)^3$ is equal to

(A) 1
(B) 0
(C) -1
(D) -2

Answer: (D) -2 · The council's preliminary key

Q287 AP EAPCET 2021 · 23 Aug · Shift 2 MCQ

If z_1, z_2 are conjugate complex numbers. Match the items under the following columns?

Column-I

A) (i) $z_1 z_2$
B) (ii) $z_1+z_2=0$
C) (iii) $\mathrm{Im}(z_1)$
D) (iv) $\mathrm{Re}(z_1)$

Column-II

a) imaginary axis
b) $\mathrm{Im}(-z_2)$
c) $|z_1|^2$
d) $\mathrm{Re}\, z_2$

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(A) (i – c) (ii – a) (iii – d) (iv – b)
(B) (i – c) (ii – a) (iii – b) (iv – d)
(C) (i – a) (ii – b) (iii – d) (iv – c)
(D) (i – b) (ii – d) (iii – c) (iv – a)

Answer: (B) (i – c) (ii – a) (iii – b) (iv – d) · The council's preliminary key

Q288 AP EAPCET 2021 · 23 Aug · Shift 2 MCQ

Let $\omega = \text{cis}\left(\frac{2\pi}{3}\right) = \cos\left(\frac{2\pi}{3}\right) + i\sin\left(\frac{2\pi}{3}\right)$ and $f(x) = x^7 - 2x^4 - 4x^3 + 8$. Which of the following option is correct?

(A) $\{2^{1/2}, 2^{1/3}, \omega, 2^{1/3}\omega\}$ is a subset of the solution set of $f(x)$.
(B) $\{2^{1/2}, -2^{1/3}, 2^{1/3}\omega^2, 2^{1/2}i\}$ is a subset of the solution set of $f(x)$.
(C) $\{2^{1/3}, 2^{1/2}, -2^{1/2}i, 2^{1/3}\omega^2\}$ is not a subset of the solution set of $f(x)$.
(D) $\{2^{1/3}, 2^{1/3}\omega, 2^{1/2}i, -2^{1/2}\}$ is a subset of the solution set of $f(x)$.

Answer: (D) $\{2^{1/3}, 2^{1/3}\omega, 2^{1/2}i, -2^{1/2}\}$ is a subset of the solution set of $f(x)$. · The council's preliminary key

Q289 AP EAPCET 2021 · 23 Aug · Shift 2 MCQ

If $\cos\alpha + 3\cos 3\beta + 5\cos 5\gamma = 0$, $\sin\alpha + 3\sin 3\beta + 5\sin 5\gamma = 0$ and $\cos 3\alpha + 27\cos 9\beta + 125\cos 15\gamma = (\lambda^2 - 4)\cos(\alpha + 3\beta + 5\gamma)$, then $\lambda =$

(A) $\pm 2\sqrt{2}$
(B) $\pm 2\sqrt{5}$
(C) ± 7
(D) $\pm\sqrt{29}$

Answer: (C) ± 7 · The council's preliminary key

Q290 AP EAPCET 2021 · 20 Aug · Shift 1 MCQ

The radius of the circle represented by $(1+i)(1+3i)(1+7i) = x + iy$ is $(i = \sqrt{-1})$

(A) 1000
(B) $10\sqrt{10}$
(C) 10000
(D) 100

Answer: (B) $10\sqrt{10}$ · The council's preliminary key

Q291 AP EAPCET 2021 · 20 Aug · Shift 1 MCQ

If $1, \alpha_1, \alpha_2, \alpha_3, \alpha_4$ are the roots of $z^5 - 1 = 0$ and ω is a cube root of units (sic) then $(\omega - 1)(\omega - \alpha_1)(\omega - \alpha_2)(\omega - \alpha_3)(\omega - \alpha_4) + \omega$ is equal to

(A) 0
(B) -1
(C) -2
(D) 1

Answer: (C) -2 · The council's preliminary key

Q292 AP EAPCET 2021 · 20 Aug · Shift 1 MCQ

If $a > 0$ and $z = x + iy$, then $\log_{\cos^2\theta}|z - a| > \log_{\cos^2\theta}|z - ai|$, $(\theta \in R)$ implies

(A) $x > y$
(B) $x < y$
(C) $x + y = \cos\theta$
(D) $x + y < 0$

Answer: (A) $x > y$ · The council's preliminary key

Q293 AP EAPCET 2021 · 20 Aug · Shift 1 MCQ

If α and β are the roots of the quadratic equation $x^2 + x + 1 = 0$, then the equation whose roots are $\alpha^{2021}, \beta^{2021}$ is given by _____

(A) $x^2 - x + 1 = 0$
(B) $x^2 + x - 1 = 0$
(C) $x^2 - x - 1 = 0$
(D) $x^2 + x + 1 = 0$

Answer: (D) $x^2 + x + 1 = 0$ · The council's preliminary key

Q294 AP EAPCET 2021 · 20 Aug · Shift 2 MCQ

If $|z_1 + z_2|^2 = |z_1|^2 + |z_2|^2$, where z_1 and z_2 are two complex numbers, then

(A) $\frac{z_1}{z_2}$ is purely real
(B) $\frac{z_1}{z_2}$ is purely imaginary
(C) $\arg\left(\frac{z_1}{z_2}\right) = \frac{\pi}{4}$
(D) $\left|\frac{z_1}{z_2}\right| = 1$

Answer: (B) $\frac{z_1}{z_2}$ is purely imaginary · The council's preliminary key

Q295 AP EAPCET 2021 · 20 Aug · Shift 2 MCQ

A real value of x will satisfy the equation $\left(\frac{3-4ix}{3+4ix}\right) = \alpha - i\beta$ (α, β are real), if

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(A) $\alpha^2 - \beta^2 = -1$
(B) $\alpha^2 - \beta^2 = 1$
(C) $\alpha^2 + \beta^2 = 1$
(D) $\alpha^2 - \beta^2 = 2$

Answer: (C) $\alpha^2 + \beta^2 = 1$ · The council's preliminary key

Q296 AP EAPCET 2021 · 20 Aug · Shift 2 MCQ

What is the value of $(1 - i\sqrt{3})^9 =$

(A) 2^9
(B) -2^9
(C) $2^9 i$
(D) $-2^9 i$

Answer: (B) -2^9 · The council's preliminary key

Q297 AP EAPCET 2021 · 20 Aug · Shift 2 MCQ

$\left(\frac{\sqrt{6}-\sqrt{2}}{4} + \frac{\sqrt{6}+\sqrt{2}}{4}i\right)^{2020} =$

(A) $\frac{1}{2} + \frac{\sqrt{3}}{2}i$
(B) $\frac{-1}{2} + \frac{\sqrt{3}}{2}i$
(C) $\frac{-1}{2} - \frac{\sqrt{3}}{2}i$
(D) $\frac{1}{2} - \frac{\sqrt{3}}{2}i$

Answer: (D) $\frac{1}{2} - \frac{\sqrt{3}}{2}i$ · The council's preliminary key

Q298 AP EAPCET 2021 · 19 Aug · Shift 1 MCQ

$(\sin\theta - i\cos\theta)^3$ is equal to

(A) $i^3(\cos 3\theta + i\sin 3\theta)$
(B) $\cos 3\theta + i\sin 3\theta$
(C) $\sin 3\theta - i\cos 3\theta$
(D) $(-i)^3(\cos 3\theta + i\sin 3\theta)$

Answer: (D) $(-i)^3(\cos 3\theta + i\sin 3\theta)$ · The council's preliminary key

Q299 AP EAPCET 2021 · 19 Aug · Shift 1 MCQ

Real part of $(\cos 4 + i\sin 4 + 1)^{2020}$ is _____

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(A) $2^{2020}\cos^{2020}2\ \cos 2020$

(B) $2^{2020}\cos^{2020}2\ \cos 4040$

(C) $2^{1020}\cos^{2020}2\ \cos 4040$

(D) $2^{2020}\cos^{2020}1\ \cos 2020$

Answer: (B) $2^{2020}\cos^{2020}2\ \cos 4040$ · The council's preliminary key

Q300 AP EAPCET 2021 · 19 Aug · Shift 2 MCQ

If $|z-2|=|z-1|$, where z is a complex number, then locus 'z' is a straight line

(A) Parallel to $x-$axis

(B) Parallel to $y-$axis

(C) Parallel to $y=x$

(D) Parallel to $y=-x$

Answer: (B) Parallel to $y-$axis · The council's preliminary key

Q301 AP EAPCET 2021 · 19 Aug · Shift 2 MCQ

If $\left(\frac{1+i}{1-i}\right)^m=1$, then 'm' can not be equal to _____

(A) 1934

(B) 2024

(C) 2172

(D) 10^{100}

Answer: (A) 1934 · The council's preliminary key

Q302 AP EAPCET 2021 · 19 Aug · Shift 2 MCQ

If $1+x^2=\sqrt{3}x$, then $\sum_{n=1}^{24}\left(x^n-\frac{1}{x^n}\right)^2$ is equal to

(A) 48

(B) -48

(C) -24

(D) 24

Answer: (B) -48 · The council's preliminary key

Q303 TS EAMCET 2021 · 6 Aug · Shift 1 MCQ

The locus of $z=x+iy$ such that $\mathrm{Im}\left(\frac{z-3i}{iz+4}\right)=0$ is

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(A) $x^2 - y^2 + 7y - 12 = 0$
(B) $x^2 + y^2 - 7y + 12 = 0$
(C) $x^2 + y^2 - 7y + 12 = 0$ and $(x, y) \neq (0, 4)$
(D) $x^2 - y^2 + 7y - 12 = 0$ and $(x, y) \neq (0, 4)$

Answer: (C) $x^2 + y^2 - 7y + 12 = 0$ **and** $(x, y) \neq (0, 4)$ · The council's preliminary key

Q304 TS EAMCET 2021 · 6 Aug · Shift 1 MCQ

If ω is a complex cube root of unity, then $\cos\left[\left(\omega^{1234} + \omega^{2021}\right)\pi - \frac{\pi}{4}\right] =$

(A) $\frac{1}{\sqrt{2}}$
(B) $\frac{1}{2}$
(C) $\frac{\sqrt{3}}{2}$
(D) $\frac{-1}{\sqrt{2}}$

Answer: (D) $\frac{-1}{\sqrt{2}}$ · The council's preliminary key

Q305 TS EAMCET 2021 · 6 Aug · Shift 1 MCQ

If z_1 and z_2 are the roots of the equation $x^2 + 2x + 2 = 0$, then $\frac{-2^{11}(z_1 + 1 + 3i)^{11}}{2^5(z_2 + 1 - 3i)^{11}} =$

(A) 64
(B) 32
(C) $16\sqrt{2}$
(D) $8\sqrt{2}$

Answer: (A) 64 · The council's preliminary key

Q306 TS EAMCET 2021 · 6 Aug · Shift 2 MCQ

If $Z = x + iy$ is a complex number and $\sqrt{x^2 - 2x + 8} + (x + 4)i = y(2 + i)$, then $Z =$

(A) $\frac{-28}{9} - \frac{16}{9}i$
(B) $-2 + 2i$
(C) $\frac{2}{3} - \frac{2}{3}i$
(D) $\frac{-2}{5} - \frac{2i}{5}$

Answer: (B) $-2 + 2i$ · The council's preliminary key

Q307 TS EAMCET 2021 · 6 Aug · Shift 2 MCQ

n is a positive integer and not a multiple of 3. If ω is non real cube root of unity, then $\omega^n + \omega^{2n} =$

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(A) -1
(B) 3
(C) -3
(D) 1

Answer: (A) -1 · The council's preliminary key

Q308 TS EAMCET 2021 · 6 Aug · Shift 2 MCQ

If n is a positive integer, then $(1+i)^n \div (1-i)^n = -i$, then n will be of the form

(A) $4k-3,\ k \in \mathbb{N}$
(B) $4k-1,\ k \in \mathbb{N}$
(C) $4k-2,\ k \in \mathbb{N}$
(D) $4k,\ k \in \mathbb{N}$

Answer: (B) $4k-1,\ k \in \mathbb{N}$ · The council's preliminary key

Q309 TS EAMCET 2021 · 5 Aug · Shift 1 MCQ

If $z_1 = 1-2i$, $z_2 = 1+i$ and $z_3 = 3+4i$, then $\left|\left(\frac{1}{z_1}+\frac{2}{z_2}\right)\frac{z_3}{z_2}\right| =$

(A) $\frac{\sqrt{7}}{2}$
(B) $\frac{\sqrt{5}}{2}$
(C) $\sqrt{\frac{45}{2}}$
(D) $\frac{\sqrt{15}}{2}$

Answer: (C) $\sqrt{\frac{45}{2}}$ · The council's preliminary key

Q310 TS EAMCET 2021 · 5 Aug · Shift 1 MCQ

If $2+2\sqrt{3}\,i = k(\cos\theta + i\sin\theta)$, $(k>0)$, then $\frac{1}{\sqrt{3}}[\cos 6\theta + i\sin 6\theta] =$

(A) 1
(B) $\frac{1}{\sqrt{3}}$
(C) $\sqrt{3}$
(D) $\frac{\sqrt{3}}{2}$

Answer: (B) $\frac{1}{\sqrt{3}}$ · The council's preliminary key

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Q311 TS EAMCET 2021 · 5 Aug · Shift 1 MCQ

If $x=\frac{4}{5}+\frac{3}{5}i$, $y=\frac{\sqrt{3}}{\sqrt{8}}-\frac{\sqrt{5}}{\sqrt{8}}i$, then $\left(x^2+\frac{1}{x^2}\right)\left(y^2-\frac{1}{y^2}\right)=$

(A) $\frac{-7\sqrt{3}}{5\sqrt{5}}i$

(B) $\frac{7}{125}i$

(C) $\frac{7\sqrt{3}}{5\sqrt{5}}i$

(D) $\frac{\sqrt{15}}{\sqrt{8}}i$

Answer: (A) $\frac{-7\sqrt{3}}{5\sqrt{5}}i$ · The council's preliminary key

Q312 TS EAMCET 2021 · 5 Aug · Shift 2 MCQ

If $(\sqrt{3}+i)^8-(\sqrt{3}-i)^8=\alpha+i\beta$, then $\alpha-\frac{\sqrt{3}}{2}\beta=$

(A) 256

(B) $384\sqrt{3}$

(C) 384

(D) $256\sqrt{3}$

Answer: (C) 384 · The council's preliminary key

Q313 TS EAMCET 2021 · 5 Aug · Shift 2 MCQ

If α,β are the roots of the equation $1+x+x^2=0$, then $(2-\alpha)(2-\beta)(2-\alpha^{10})(2-\alpha^{20})=$

(A) 36

(B) 64

(C) 49

(D) 81

Answer: (C) 49 · The council's preliminary key

Q314 TS EAMCET 2021 · 5 Aug · Shift 2 MCQ

For $n\in\mathbb{N}$, $\left(\frac{1+\cos\theta+i\sin\theta}{1+\cos\theta-i\sin\theta}\right)^n=$

(A) $\cos(n\theta)-i\sin n\theta$

(B) $-\cos(n\theta)+i\sin(n\theta)$

(C) $\cos(n\theta)+i\sin n\theta$

(D) $-\cos(n\theta)-i\sin n\theta$

Answer: (C) $\cos(n\theta)+i\sin n\theta$ · The council's preliminary key

Q315 TS EAMCET 2021 · 4 Aug · Shift 1 MCQ

If $(a+ib)^{\frac{1}{4}} = 2+3i$, then $3b-2a =$

(A) -22

(B) -122

(C) -598

(D) -698

Answer: (B) -122 · The council's preliminary key

Q316 TS EAMCET 2021 · 4 Aug · Shift 1 MCQ

ω is a complex cube root of unity. Match the items of List-I to the items of List-II

List-I

A) $\omega^{1010}+\omega^{2020}$

B) $(1+\omega-\omega^2)(1-\omega+\omega^2)$

C) $(2+\omega^2+\omega^4)^5$

D) $(3+5\omega+3\omega^2)^3$

List-II

I) 0

II) 1

III) -1

IV) 4

V) 8

The correct match is

(A) A-III, B-IV, C-I, D-V

(B) A-I, B-IV, C-II, D-V

(C) A-III, B-IV, C-II, D-V

(D) A-III, B-I, C-II, D-IV

Answer: (C) A-III, B-IV, C-II, D-V · The council's preliminary key

Q317 TS EAMCET 2021 · 4 Aug · Shift 1 MCQ

If the roots of the equation $(z-4)^3 = 8i$ are $a-2i,\ b+i$, and $c+i$, then $\sqrt{abc} =$

(A) $13\sqrt{3}$

(B) $4\sqrt{13}$

(C) $2\sqrt{13}$

(D) $5\sqrt{3}$

Answer: (C) $2\sqrt{13}$ · The council's preliminary key

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Q318 TS EAMCET 2021 · 4 Aug · Shift 2 MCQ

If $x+iy=\dfrac{1+7i}{(2-i)^2}$; then $\operatorname{cosec}\left(\operatorname{Tan}^{-1}\dfrac{y}{x}-\dfrac{\pi}{4}\right)=$

(A) 1
(B) ∞
(C) -1
(D) 0

Answer: (C) -1 · The council's preliminary key

Q319 TS EAMCET 2021 · 4 Aug · Shift 2 MCQ

If ω represents a cube root of unity and $\sum_{k=1}^{n}\left(k+\dfrac{1}{\omega}\right)\left(k+\dfrac{1}{\omega^2}\right)=340$, then $n=$

(A) 20
(B) 25
(C) 10
(D) 15

Answer: (C) 10 · The council's preliminary key

Q320 TS EAMCET 2021 · 4 Aug · Shift 2 MCQ

$\sum_{k=1}^{6}\left(\sin\dfrac{2\pi k}{7}-i\cos\dfrac{2\pi k}{7}\right)=$

(A) i
(B) $-i$
(C) $2i$
(D) $-2i$

Answer: (A) i · The council's preliminary key

Q321 AP EAMCET 2020 · 7 Oct · Shift 1 MCQ

The value of $|z|^2+|z-3|^2+|z-i|^2$ is minimum when z equals

(A) $2-\dfrac{2}{3}i$
(B) $45+3i$
(C) $1+\dfrac{1}{3}i$
(D) $1-\dfrac{1}{3}i$

Answer: (C) $1+\dfrac{1}{3}i$ · The council's preliminary key

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Q322 AP EAMCET 2020 · 23 Sep · Shift 1 MCQ

$\left(\frac{1+\cos(3\theta)+i\sin(3\theta)}{1+\cos(3\theta)-i\sin(3\theta)}\right)^{20} = ?$

(A) $\cos(60\theta)+i\sin(60\theta)$

(B) $\cos(60\theta)-i\sin(60\theta)$

(C) $\cos(20\theta)+i\sin(20\theta)$

(D) $\cos(20\theta)-i\sin(20\theta)$

Answer: (A) $\cos(60\theta)+i\sin(60\theta)$ · The council's preliminary key

Q323 AP EAMCET 2020 · 23 Sep · Shift 1 MCQ

Suppose $z \in C$ has argument θ such that $0 < \theta < \frac{\pi}{2}$ and satisfy the equation $|z-3i| = 3$. Then what is the value of $\cot\theta - \frac{6}{z}$?

(A) $2i$

(B) i

(C) $-i$

(D) $-2i$

Answer: (B) i · The council's preliminary key

Q324 AP EAMCET 2020 · 22 Sep · Shift 1 MCQ

If ω is a complex cube root of unity, then $\sin\left\{(\omega^{10}+\omega^{23})\pi - \frac{\pi}{4}\right\} =$

(A) $\frac{1}{\sqrt{2}}$

(B) $\frac{1}{2}$

(C) 1

(D) $\frac{\sqrt{3}}{2}$

Answer: (A) $\frac{1}{\sqrt{2}}$ · The council's preliminary key

Q325 AP EAMCET 2020 · 22 Sep · Shift 1 MCQ

If α, β are the roots of the equation $x^2 - 2x + 4 = 0$, then $\alpha^n + \beta^n =$ _____ $\times \cos\left(\frac{n\pi}{3}\right)$ for any $n \in N$

(A) 2^n

(B) 2^{n+1}

(C) 2^{n-1}

(D) 2^{n-2}

Answer: (B) 2^{n+1} · The council's preliminary key

Q326 AP EAMCET 2020 · 22 Sep · Shift 1 MCQ

The modulus of the complex number $\left(\frac{2+i\sqrt{5}}{2-i\sqrt{5}}\right)^{10}+\left(\frac{2-i\sqrt{5}}{2+i\sqrt{5}}\right)^{10}$ is _____

(A) $2\cos\left(20\,\mathrm{Cos}^{-1}\left(\frac{2}{3}\right)\right)$

(B) $2\sin\left(10\,\mathrm{Cos}^{-1}\left(\frac{2}{3}\right)\right)$

(C) $2\cos\left(10\,\mathrm{Cos}^{-1}\left(\frac{2}{3}\right)\right)$

(D) $2\sin\left(20\,\mathrm{Cos}^{-1}\left(\frac{2}{3}\right)\right)$

Answer: (A) $2\cos\left(20\,\mathrm{Cos}^{-1}\left(\frac{2}{3}\right)\right)$ · The council's preliminary key

Q327 AP EAMCET 2020 · 22 Sep · Shift 2 MCQ

Cube roots of unity are the vertices of a/an _____, which is inscribed in a circle of unit radius, with its center at origin

(A) Right angled triangle

(B) Equilateral triangle

(C) Scalene triangle

(D) Isosceles triangle

Answer: (B) Equilateral triangle · The council's preliminary key

Q328 AP EAMCET 2020 · 22 Sep · Shift 2 MCQ

$\left(\cos\frac{\pi}{2}+i\sin\frac{\pi}{2}\right)\times\left(\cos\frac{\pi}{4}+i\sin\frac{\pi}{4}\right)\times\left(\cos\frac{\pi}{8}+i\sin\frac{\pi}{8}\right)\times\cdots\cdots\infty=$

(A) 1

(B) 0

(C) -1

(D) 2

Answer: (C) -1 · The council's preliminary key

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Q329 AP EAMCET 2020 · 22 Sep · Shift 2 MCQ

Find the conjugate of $\frac{5i}{7+i}$

(A) $\frac{1}{10}(1-7i)$
(B) $\frac{1}{10}(7i-1)$
(C) $\frac{1}{10}(1+7i)$
(D) $\frac{1}{\sqrt{50}}(1-7i)$

Answer: (A) $\frac{1}{10}(1-7i)$ · The council's preliminary key

Q330 AP EAMCET 2020 · 22 Sep · Shift 2 MCQ

If $\left|\frac{z-25}{z-1}\right| = 5$ then $|z| =$

(A) 5
(B) 3
(C) 4
(D) 10

Answer: (A) 5 · The council's preliminary key

Q331 AP EAMCET 2020 · 21 Sep · Shift 1 MCQ

Geometrically, the set $\{z \in \mathbb{C} : |z-2-2i| \leq 1\}$ represents _____

(A) a closed circular disc with center at $(-2,-2)$ and with radius 1
(B) a closed circular disc with center at $(2,2)$ and with radius 1.
(C) a closed circular disc with center at $(1,1)$ and with radius 0.5 .
(D) a closed circular disc with center at $(-1,-1)$ and with radius 0.5

Answer: (B) a closed circular disc with center at $(2,2)$ and with radius 1. · The council's preliminary key

Q332 AP EAMCET 2020 · 21 Sep · Shift 1 MCQ

If α, β and γ are angles that satisfy the following conditions, find the value of xyz

a) $\tan(\alpha)+\tan(\beta)+\tan(\gamma) = \tan(\alpha)\cdot\tan(\beta)\cdot\tan(\gamma)$
b) $x = \cos(\alpha) + i\sin(\alpha)$
c) $y = \cos(\beta) + i\sin(\beta)$
d) $z = \cos(\gamma) + i\sin(\gamma)$

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(A) 1, but not -1

(B) -1, but not 1

(C) ± 1

(D) 0

Answer: (C) ± 1 · The council's preliminary key

Q333 AP EAMCET 2020 · 21 Sep · Shift 1 MCQ

$(-i+\sqrt{3})^{300}+(-i-\sqrt{3})^{300}=$

(A) 2^{300}

(B) 2^{301}

(C) 2^{100}

(D) -2^{300}

Answer: (B) 2^{301} · The council's preliminary key

Q334 AP EAMCET 2020 · 21 Sep · Shift 2 MCQ

The locus of z satisfying $\left|\frac{z-i}{z-2i}\right|=2$ is a

(A) Hyperbola

(B) Circle

(C) Straight line

(D) Ellipse

Answer: (B) Circle · The council's preliminary key

Q335 AP EAMCET 2020 · 21 Sep · Shift 2 MCQ

For how many natural numbers 'n' such that $1 \leq n \leq 2021$ is $\left(\frac{1+i}{1-i}\right)^n = 1$?

(A) 504

(B) 505

(C) 506

(D) 503

Answer: (B) 505 · The council's preliminary key

Q336 AP EAMCET 2020 · 21 Sep · Shift 2 MCQ

If $x+iy=\frac{3}{2+\cos(\theta)+i\sin(\theta)}$, then $x^2+y^2=$ _____

(A) $4x - 3$
(B) $4x + 3$
(C) 0
(D) 1

Answer: (A) $4x - 3$ · The council's preliminary key

Q337 AP EAMCET 2020 · 18 Sep · Shift 1 MCQ

Let the complex numbers α and $(1/\alpha)$ lie on circles $(x - x_0)^2 + (y - y_0)^2 = r^2$ and $(x - x_0)^2 + (y - y_0)^2 = 4r^2$ respectively. If $z_0 = x_0 + iy_0$ satisfies the equation $2|z_0|^2 = r^2 + 2$ then $|\alpha| =$

(A) $\frac{1}{\sqrt{2}}$
(B) $\frac{1}{2}$
(C) $\frac{1}{\sqrt{7}}$
(D) $\frac{1}{3}$

Answer: (C) $\frac{1}{\sqrt{7}}$ · The council's preliminary key

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Q338 AP EAMCET 2020 · 18 Sep · Shift 2 MCQ

The equation of any _____ in the complex plane is of the form $z\bar{z} + b\bar{z} + \bar{b}z + c = 0$ where ($b \in C$, $c \in R$)

(A) Circle
(B) Straight line
(C) Parabola
(D) Hyperbola

Answer: (A) Circle · The council's preliminary key

Q339 AP EAMCET 2020 · 18 Sep · Shift 2 MCQ

Let $z = x + yi$, where x, y are integers and $i = \sqrt{-1}$ the area of the rectangle whose vertices are the roots of the equation $\bar{z}z^3 + z(\bar{z})^3 = 350$ is _____

(A) 32
(B) 40
(C) 48
(D) 80

Answer: (C) 48 · The council's preliminary key

Q340 AP EAMCET 2020 · 18 Sep · Shift 2 MCQ

If m and n are the least and greatest values of $|z|$ respectively and $|z-4+3i| \leq 1$. Let k be the least value of $\frac{x^4+x^2+4}{x}$ on the interval $(0,\infty)$. Then $k=$

(A) n
(B) m
(C) $m+n$
(D) mn

Answer: (A) n · The council's preliminary key

Q341 AP EAMCET 2020 · 18 Sep · Shift 2 MCQ

If α, β are the roots of $x^2-2x+4=0$, for $n \in N$, what is the value of $\alpha^n+\beta^n=$

(A) $2^{n+2}\cos\left(\frac{n\pi}{3}\right)$
(B) $2^{n+1}\cos\left(\frac{n\pi}{3}\right)$
(C) $2^{n+1}\cos\left(\frac{n\pi}{6}\right)$
(D) $2^{n+2}\cos\left(\frac{n\pi}{6}\right)$

Answer: (B) $2^{n+1}\cos\left(\frac{n\pi}{3}\right)$ · The council's preliminary key

Q342 AP EAMCET 2020 · 17 Sep · Shift 1 MCQ

If $1, \alpha, \alpha^2, \cdots\cdots, \alpha^{n-1}$ are the n-th roots of unity, then $\sum_{i=1}^{n-1}\frac{1}{2-\alpha^i}$ is equal to

(A) $(n-2)2^n$
(B) $\frac{(n-2)2^{n-1}+1}{2^n-1}$
(C) $\frac{(n-2)2^{n-1}}{2^n-1}$
(D) $\frac{1}{(n-2)2^n}$

Answer: (B) $\frac{(n-2)2^{n-1}+1}{2^n-1}$ · The council's preliminary key

Q343 AP EAMCET 2020 · 17 Sep · Shift 1 MCQ

If $2\alpha=-1-i\sqrt{3}$ and $2\beta=-1+i\sqrt{3}$ then $5\alpha^4+5\beta^4+7\alpha^{-1}\beta^{-1}$ is equal to _____

(A) -1
(B) -2
(C) 0
(D) 2

Answer: (D) 2 · The council's preliminary key

Q344 AP EAMCET 2020 · 17 Sep · Shift 1 MCQ

If $a+bi=\frac{i}{1-i}$, then $(a,b)=$

(A) $\left(\frac{-1}{2},\frac{-1}{2}\right)$
(B) $\left(\frac{1}{2},\frac{1}{2}\right)$
(C) $\left(\frac{1}{2},\frac{-1}{2}\right)$
(D) $\left(\frac{-1}{2},\frac{1}{2}\right)$

Answer: (D) $\left(\frac{-1}{2},\frac{1}{2}\right)$ · The council's preliminary key

Q345 AP EAMCET 2020 · 17 Sep · Shift 2 MCQ

Let z_1, z_2 be two complex numbers such that $\bar{z}_1 - i\bar{z}_2 = 0$ and $arg(z_1z_2)=\frac{3\pi}{4}$, then $arg(z_1)=$

(A) $\frac{\pi}{4}$
(B) $\frac{-\pi}{8}$
(C) $\frac{\pi}{8}$
(D) $\frac{\pi}{3}$

Answer: (C) $\frac{\pi}{8}$ · The council's preliminary key

Q346 AP EAMCET 2020 · 17 Sep · Shift 2 MCQ

If $x+iy=\frac{(3+2i)(4-7i)(12+13i)}{(13-12i)(2-3i)(11+3i)}$, then $x^2+y^2=$

(A) 1
(B) 2
(C) $\frac{1}{2}$
(D) 3

Answer: (C) $\frac{1}{2}$ · The council's preliminary key

Q347 AP EAMCET 2020 · 17 Sep · Shift 2 MCQ

Roots of the equation $x^3-3x^2+3x-9=0$ are _____

(A) $3,\ 1+2\omega,\ 1+2\omega^2$
(B) $3,\ -1+2\omega,\ -1-2\omega^2$
(C) $3,\ 2-\omega,\ 2-\omega^2$
(D) $1,\ 1+2\omega,\ 1+2\omega^2$

Answer: (A) $3,\ 1+2\omega,\ 1+2\omega^2$ · The council's preliminary key

Q348 AP EAMCET 2020 · 17 Sep · Shift 2 MCQ

What is the modulus of the complex number $(1+2i)(-2+i)$?

(A) $\sqrt{5}$
(B) 5
(C) $5\sqrt{5}$
(D) $\sqrt{35}$

Answer: (B) 5 · The council's preliminary key

Q349 TS EAMCET 2020 · 14 Sep · Shift 1 MCQ

z_1, z_2 are two fixed points on the Argand plane. If z is a complex number such that $|z - z_1| + |z - z_2| = \lambda$, then the locus of z is

(A) a circle when $|z_1 - z_2| < \lambda$
(B) a parabola when $|z_1 + z_2| = \lambda$
(C) an ellipse when $|z_1 - z_2| < \lambda$
(D) a straight line when $|z_1| = |z_2| = \lambda$

Answer: (C) an ellipse when $|z_1 - z_2| < \lambda$ · Official TGCHE final key

Q350 TS EAMCET 2020 · 14 Sep · Shift 1 MCQ

If the four points A, B, C, D in the Argand plane represented respectively by the complex numbers $2 + i$, $4 + 3i$, $2 + 5i$, $3i$ lie on a circle, then the centre of the circle is

(A) $1 + 2i$
(B) $3 + 2i$
(C) $3 + 4i$
(D) $2 + 3i$

Answer: (D) $2 + 3i$ · Official TGCHE final key

Q351 TS EAMCET 2020 · 14 Sep · Shift 1 MCQ

The roots of the equation $(x - 1)^5 = 32(x + 1)^5$ are

(A) $\frac{1+2e^{2k\pi i/5}}{1-2e^{2k\pi i/5}}$, $k = 1, 2, 3, 4, 5$
(B) $\frac{1-2e^{2k\pi i/5}}{1+2e^{2k\pi i/5}}$, $k = 0, 1, 2, 3, 4$
(C) $1, 2\omega, 3\omega^2, 2\omega + 3\omega^2, 5\omega^2 + 7$
(D) $\frac{3+2e^{2(k+1)\pi i/5}}{3-2e^{2(k+1)\pi i/5}}$, $k = 0, 1, 2, 3, 4$

Answer: (A) $\frac{1+2e^{2k\pi i/5}}{1-2e^{2k\pi i/5}}$, $k = 1, 2, 3, 4, 5$ · Official TGCHE final key

Q352 TS EAMCET 2020 · 14 Sep · Shift 1 MCQ

If ω is a non-real cube root of unity and $x = \omega^2 - \omega - 3$, then the value of $x^4 + 6x^3 + 10x^2 - 12x - 19$ is

(A) 5

(B) 7

(C) 12

(D) -19

Answer: (A) 5 · Official TGCHE final key

Q353 TS EAMCET 2020 · 14 Sep · Shift 2 MCQ

Let z be a complex number such that $|z| - z = 2 + i$, where $i = \sqrt{-1}$. Then, $|z| =$

(A) $\frac{5}{2}$

(B) $\frac{\sqrt{41}}{4}$

(C) $\frac{5}{3}$

(D) $\frac{5}{4}$

Answer: (D) $\frac{5}{4}$ · Official TGCHE final key

Q354 TS EAMCET 2020 · 14 Sep · Shift 2 MCQ

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) $x - y + 1 = 0$

Answer: (D) $x - y + 1 = 0$ · Official TGCHE final key

Q355 TS EAMCET 2020 · 14 Sep · Shift 2 MCQ

For $n > 1$ and $n \in \mathbb{N}$, if $z_1, z_2, \ldots, z_n$ are the roots of the equation $(z+1)^n = z^n$, then $\sum_{i=1}^{n} \frac{\cot^{-1}(2|\operatorname{Im} z_i|)-1}{2 \operatorname{Re} z_i} =$

(A) 0

(B) i

(C) $\frac{1}{2}[\pi - (\pi - 2)n]$

(D) $\frac{1}{2}[\pi + (\pi + 2)n]$

Answer: (C) $\frac{1}{2}[\pi - (\pi - 2)n]$ · Official TGCHE final key

Q356 TS EAMCET 2020 · 11 Sep · Shift 1 MCQ

$A(z_1 = 2 + 2i)$, $B(z_2)$, $C(z_3)$ are three points on the Argand plane satisfying $|z_k - 2i| = 2$, $(k = 1, 2, 3)$. If ΔABC encloses the maximum area, then the sum of the imaginary parts of z_2 and z_3 is

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(A) 1
(B) 0
(C) 4
(D) -4

Answer: (C) 4 · Official TGCHE final key

Q357 TS EAMCET 2020 · 11 Sep · Shift 1 MCQ

For $n \in N$, If $A_n = \cos\left(\frac{\pi}{2^n}\right) + i\sin\left(\frac{\pi}{2^n}\right)$, then $(A_1A_2A_3A_4)^4 =$

(A) $\frac{-1-i}{\sqrt{2}}$
(B) 1
(C) 0
(D) $\frac{1-i}{\sqrt{2}}$

Answer: (D) $\frac{1-i}{\sqrt{2}}$ · Official TGCHE final key

Q358 TS EAMCET 2020 · 11 Sep · Shift 1 MCQ

Let $A_r = \left(x+\frac{1}{x}\right)^3 \cdot \left(x^2+\frac{1}{x^2}\right)^3 \cdot \left(x^3+\frac{1}{x^3}\right)^3 \cdots \left(x^r+\frac{1}{x^r}\right)^3$. If $x^2+x+1=0$, then $\frac{1}{A_3}+\frac{1}{A_6}+\frac{1}{A_9}+\frac{1}{A_{12}}+\cdots\infty =$

(A) $\frac{1}{6}$
(B) $\frac{2}{5}$
(C) 1
(D) $\frac{1}{7}$

Answer: (D) $\frac{1}{7}$ · Official TGCHE final key

Q359 TS EAMCET 2020 · 11 Sep · Shift 2 MCQ

The number of points z on the Argand plane which satisfy the conditions $\mathrm{Re}\left(\frac{z-2}{z-4i}\right) = 0$ and $\mathrm{Im}\left(\frac{z-2}{z-4i}\right) = 1$ simultaneously is

(A) 0
(B) 1
(C) 2
(D) infinitely many

Answer: (B) 1 · Checked by our team

Q360 TS EAMCET 2020 · 11 Sep · Shift 2 MCQ

Let $a = 1 + i$ and $z = x + iy$. If the curve $z\bar{z} + az + \overline{az} - 4 = 0$ is cut by the straight line $(z + \bar{z}) - i(z - \bar{z}) + 2 = 0$ at two points A and B, then the equation of the circle passing through the origin, A and B is

(A) $x^2 + y^2 + 3x - 4y = 0$
(B) $x^2 + y^2 + x + y = 0$
(C) $x^2 + y^2 + 6x + 2y = 0$
(D) $x^2 + y^2 - 7x - 12y = 0$

Answer: (C) $x^2 + y^2 + 6x + 2y = 0$ · Official TGCHE final key

Q361 TS EAMCET 2020 · 11 Sep · Shift 2 MCQ

If $(\sqrt{3} + i)^{10} = a + bi$, $a, b \in \mathbb{R}$, then the values of a and b are respectively

(A) 64 and $-64\sqrt{3}$
(B) 128 and $128\sqrt{3}$
(C) 256 and $256\sqrt{3}$
(D) 512 and $-512\sqrt{3}$

Answer: (D) 512 and $-512\sqrt{3}$ · Official TGCHE final key

Q362 TS EAMCET 2020 · 11 Sep · Shift 2 MCQ

If z is a complex number such that $z^2 + z + 1 = 0$, then $\left(z + \frac{1}{z}\right)^3 + \left(z^2 + \frac{1}{z^2}\right)^3 + \left(z^3 + \frac{1}{z^3}\right)^3 + \ldots\cdots + \left(z^{2020} + \frac{1}{z^{2020}}\right)^3 =$

(A) 4037
(B) -2020
(C) 4038
(D) $2020 + 673\,i$

Answer: (A) 4037 · Official TGCHE final key

Q363 TS EAMCET 2020 · 10 Sep · Shift 1 MCQ

Let $z = x + iy$ be a complex number, $A = \{z / |z| \leq 2\}$ and $B = \{z / (1-i)z + (1+i)\bar{z} \geq 4\}$. Then which one of the following options belongs to $A \cap B$?

(A) $\sqrt{3} + \frac{1}{2}i$

(B) $\frac{1}{2} + \frac{i}{2}$

(C) $\sqrt{2} + \frac{i}{2}$

(D) $2 + 2i$

Answer: (A) $\sqrt{3} + \frac{1}{2}i$ · Official TGCHE final key

Q364 TS EAMCET 2020 · 10 Sep · Shift 1 MCQ

The solutions of the equation $z^2(1 - z^2) = 16$, $z \in \mathbb{C}$, lie on the curve

(A) $|z| = 1$

(B) $|z| = \frac{2}{|z|}$

(C) $|z|^2 = 3|z| + 2$

(D) $|z| = 2$

Answer: (D) $|z| = 2$ · Official TGCHE final key

Q365 TS EAMCET 2020 · 10 Sep · Shift 1 MCQ

If $z, \bar{z}, -z, -\bar{z}$ forms a rectangle of area $2\sqrt{3}$ square units, then one such z is

(A) $\frac{1}{2} + \sqrt{3}\,i$

(B) $\frac{\sqrt{5} + \sqrt{3}\,i}{4}$

(C) $\frac{3}{2} + \frac{\sqrt{3}\,i}{2}$

(D) $\frac{\sqrt{3} + \sqrt{11}\,i}{2}$

Answer: (A) $\frac{1}{2} + \sqrt{3}\,i$ · Official TGCHE final key

Q366 TS EAMCET 2020 · 10 Sep · Shift 1 MCQ

$$\left(\frac{\cos\theta + i\sin\theta}{\sin\theta + i\cos\theta}\right)^8 + \left(\frac{1 + \cos\theta - i\sin\theta}{1 + \cos\theta + i\sin\theta}\right)^{16} =$$

(A) $2\cos 8\theta$

(B) $2\cos 16\theta$

(C) $2\sin 8\theta$

(D) $2\sin 16\theta$

Answer: (B) $2\cos 16\theta$ · Official TGCHE final key

Q367 TS EAMCET 2020 · 10 Sep · Shift 2 MCQ

If $z_1 = x_1 + iy_1$, $z_2 = x_2 + iy_2$, $z_3 = x_1 + \frac{ix_2}{2}$, $z_4 = 2y_1 + iy_2$ are complex numbers such that $|z_1| = 1$, $|z_2| = 2$ and $\mathrm{Re}(z_1 z_2) = 0$, then

(A) $|z_3| = 1$, $|z_4| = 2$, $\mathrm{Im}(z_3\bar{z}_4) = 0$

(B) $|z_3| = 2$, $|z_4| = 1$, $\mathrm{Re}(z_3 z_4) = 0$

(C) $|z_3| = 1$, $|z_4| = 2$, $\mathrm{Re}(z_3 z_4) = 0$

(D) $|z_3| = 2$, $|z_4| = 1$, $\mathrm{Re}(z_1 z_3) = \mathrm{Im}(z_2 z_4) = 0$

Answer: (C) $|z_3| = 1$, $|z_4| = 2$, $\mathrm{Re}(z_3 z_4) = 0$ · Official TGCHE final key

Q368 TS EAMCET 2020 · 10 Sep · Shift 2 MCQ

Assertion (A): If z is a complex number such that $|z| \geq 3$, then the least value of $\left|z + \frac{3}{z}\right|$ is 1.
Reason (R): $|z_1 - z_2| \leq |z_1| + |z_2|$, for any two complex numbers z_1, z_2
The correct option among the following is

(A) (A) is true, (R) is true and (R) is the correct explanation for (A)

(B) (A) is true, (R) is true but (R) is not the correct explanation for (A)

(C) (A) is true but (R) is false

(D) (A) is false but (R) is true

Answer: (D) (A) is false but (R) is true · Official TGCHE final key

Q369 TS EAMCET 2020 · 10 Sep · Shift 2 MCQ

If $\left(\frac{\cos\theta + i\sin\theta}{\sin\theta + i\cos\theta}\right)^{2020} + \left(\frac{1+\cos\theta+i\sin\theta}{1-\cos\theta+i\sin\theta}\right)^{2021} = x + iy$, then the value of $x + y$ at $\theta = \frac{\pi}{2}$ is

(A) 2

(B) 1

(C) -1

(D) 2020

Answer: (A) 2 · Official TGCHE final key

Q370 TS EAMCET 2020 · 10 Sep · Shift 2 MCQ

If ω is a complex cube root of unity, then $\sum_{x=1}^{10}\left((\omega x + 2)(\omega^2 x + 2) - 3\right) =$

(A) 285
(B) 945
(C) 1025
(D) 705

Answer: (A) 285 · Official TGCHE final key

Q371 TS EAMCET 2020 · 9 Sep · Shift 1 MCQ

Let $z \in \mathbb{C}$ and $i = \sqrt{-1}$, if $a, b, c \in (0, 1)$ be such that $a^2 + b^2 + c^2 = 1$ and $b + ic = (1 + a)z$, then $\frac{1+iz}{1-iz} =$

(A) $\frac{a+ib}{1+c}$
(B) $\frac{a-ib}{1+c}$
(C) $\frac{a-ib}{1-c}$
(D) $\frac{a+ib}{1-c}$

Answer: (A) $\frac{a+ib}{1+c}$ · Official TGCHE final key

Q372 TS EAMCET 2020 · 9 Sep · Shift 1 MCQ

If $A = \{z = x + iy \ / \ \text{real part of } \frac{z-1}{z-i} = 2\}$, then the locus of the point $P(x, y)$ in the cartesian plane is

(A) a pair of lines passing through $(-1, -1)$
(B) a circle of radius $\frac{1}{\sqrt{2}}$ and the centre $\left(\frac{-1}{2}, \frac{3}{2}\right)$
(C) a pair of lines passing through $(-1, -2)$
(D) a circle of radius $\frac{1}{2}$

Answer: (B) a circle of radius $\frac{1}{\sqrt{2}}$ and the centre $\left(\frac{-1}{2}, \frac{3}{2}\right)$ · Checked by our team

Q373 TS EAMCET 2020 · 9 Sep · Shift 1 MCQ

If ω is a complex cube root of unity, then $(1 - \omega + \omega^2)^6 + (1 - \omega^2 + \omega)^6 =$

(A) 0
(B) 6
(C) 64
(D) 128

Answer: (D) 128 · Official TGCHE final key

Q374 TS EAMCET 2020 · 9 Sep · Shift 1 MCQ

If $\sqrt{x} + \frac{1}{\sqrt{x}} = 2\cos\theta$, then $x^6 + x^{-6} =$

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(A) $2\cos 6\theta$
(B) $2\cos 12\theta$
(C) $2\cos 3\theta$
(D) $2\sin 3\theta$

Answer: (B) $2\cos 12\theta$ · Official TGCHE final key

Q375 TS EAMCET 2020 · 9 Sep · Shift 2 MCQ

Let $a, b \in \mathbb{R}$ and the roots α, β of the equation $z^2 + az + b = 0$ be complex. If the origin, α and β represent the vertices of an equilateral triangle on the Argand plane, then

(A) $a = b$
(B) $a^2 = 3b$
(C) $a^2 = 4b$
(D) $a = 3b$

Answer: (B) $a^2 = 3b$ · Official TGCHE final key

Q376 TS EAMCET 2020 · 9 Sep · Shift 2 MCQ

Assertion (A): If the arguments of $\bar{z}_1$ and z_2 are $\frac{\pi}{5}$ and $\frac{\pi}{3}$ respectively, then $\arg(z_1 z_2)$ is $\frac{2\pi}{15}$.
Reason (R): For any complex number z, $\arg \bar{z} = \frac{\pi}{2} + \arg z$.
The correct option among the following is

(A) (A) is true, (R) is true and (R) is the correct explanation for (A)
(B) (A) is true, (R) is true but (R) is not the correct explanation for (A)
(C) (A) is true but (R) is false
(D) (A) is false but (R) is true

Answer: (C) (A) is true but (R) is false · Official TGCHE final key

Q377 TS EAMCET 2020 · 9 Sep · Shift 2 MCQ

If ω is a complex cube root of unity, then $\left(\frac{1-\sqrt{3}i}{2}\right)^{2020} + \left(\frac{1+\sqrt{3}i}{2}\right)^{2026} + \sin\left(\sum_{j=1}^{6}(j+\omega)(j+\omega^2)\frac{3\pi}{152}\right) =$

(A) -2
(B) 2
(C) -1
(D) 0

Answer: (A) -2 · Official TGCHE final key

Q378 TS EAMCET 2020 · 9 Sep · Shift 2 MCQ

If $z = e^{i\theta}$ and $\frac{3\cos 3\theta + 2\cos 2\theta + 5\cos 5\theta}{3\sin 3\theta + 2\sin 2\theta + 5\sin 5\theta} = \frac{i\sum_{r=0}^{10} a_r z^r}{\sum_{r=0}^{10} b_r z^r}$ then $\frac{\left(\sum_{r=0}^{10} a_r + \sum_{r=0}^{10} b_r\right)}{10} =$

(A) 0
(B) 1
(C) 2
(D) 3

Answer: (C) 2 · Official TGCHE final key

Q379 TS EAMCET 2019 · 6 May · Shift 1 MCQ

The locus of a point on the Argand plane represented by the complex number z, when z satisfies the condition $\left|\frac{z-1+i}{z+1-i}\right| = \left|\mathrm{Re}\left(\frac{z-1+i}{z+1-i}\right)\right|$ is

(A) A straight line that does not contain the point $(-1+i)$
(B) A circle that doesnot contain the point $(-1+i)$
(C) A parabola that doesnot contain the point $(-1+i)$
(D) A hyperbola that doesnot contain the point $(-1+i)$

Answer: (A) A straight line that does not contain the point $(-1+i)$ · Official TGCHE final key

Q380 TS EAMCET 2019 · 6 May · Shift 1 MCQ

The sum of the products of the non-conjugate roots of $i^{1/4}$ taken two at a time is

(A) 2
(B) 0
(C) -1
(D) -2

Answer: (B) 0 · Official TGCHE final key

Q381 TS EAMCET 2019 · 6 May · Shift 1 MCQ

If $z = \cos\alpha + i\sin\alpha;\ 0 < \alpha < \pi/4$, then $\left|\frac{1+z^4}{1-z^3}\right| =$

(A) $\frac{\cos 2\alpha}{\sin \frac{3}{2}\alpha}$
(B) $\frac{\cos \alpha}{\sin \frac{3}{2}\alpha}$
(C) $\frac{\cos 2\alpha}{\sin \frac{\alpha}{2}}$
(D) $\frac{\cos \alpha}{\sin \frac{\alpha}{2}}$

Answer: (A) $\frac{\cos 2\alpha}{\sin \frac{3}{2}\alpha}$ · Official TGCHE final key

Q382 TS EAMCET 2019 · 6 May · Shift 1 MCQ

If $1, \omega, \omega^2, \ldots, \omega^8$ are the roots of the equation $x^9 - 1 = 0$, then $\sum_{r=1}^{8}(\omega^r)^{99} =$

(A) 0
(B) 8
(C) 1
(D) ω

Answer: (B) 8 · Official TGCHE final key

Q383 TS EAMCET 2019 · 4 May · Shift 1 MCQ

If $z_n = \left(1 + i\sqrt{2}\right)^n$, $n \in \mathbb{Z}$, then $\frac{1}{9}\mathrm{Re}\left(z_4\overline{z_5}\right) =$

(A) 81
(B) 27
(C) 9
(D) 3

Answer: (C) 9 · Official TGCHE final key

Q384 TS EAMCET 2019 · 4 May · Shift 1 MCQ

If $z = x + iy$, then the centre of the circle $\left|\frac{z-3}{z-2i}\right| = 2$ is

(A) $\left(-1, -\frac{8}{3}\right)$
(B) $\left(1, \frac{8}{3}\right)$
(C) $\left(-1, \frac{8}{3}\right)$
(D) $\left(1, -\frac{8}{3}\right)$

Answer: (C) $\left(-1, \frac{8}{3}\right)$ · Official TGCHE final key

Q385 TS EAMCET 2019 · 4 May · Shift 1 MCQ

If z is a complex number such that $|z + 4| \geq 3$, then the smallest value of $|z + 3|$ is

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(A) 3
(B) 1
(C) 2
(D) 0

Answer: (C) 2 · Official TGCHE final key

Q386 TS EAMCET 2019 · 4 May · Shift 1 MCQ

The real part of a z that satisfies $iz^4 + 1 = 0$ is

(A) $\sin\frac{\pi}{4}$
(B) $\cos\frac{\pi}{8}$
(C) 0
(D) -1

Answer: (B) $\cos\frac{\pi}{8}$ · Official TGCHE final key

Q387 TS EAMCET 2019 · 4 May · Shift 2 MCQ

If $z = \sqrt{2}\sqrt{1+\sqrt{3}i}$ represents a point P in the Argand plane and P lies in the third quadrant, then the polar form of z is

(A) $2\left[\cos\left(\frac{-4\pi}{3}\right) + i\sin\left(\frac{-4\pi}{3}\right)\right]$
(B) $2\left[\cos\left(\frac{-5\pi}{6}\right) + i\sin\left(\frac{-5\pi}{6}\right)\right]$
(C) $2\left[\cos\left(\frac{-\pi}{6}\right) + i\sin\left(\frac{-\pi}{6}\right)\right]$
(D) $2\left[\cos\left(\frac{-2\pi}{3}\right) + i\sin\left(\frac{-2\pi}{3}\right)\right]$

Answer: (B) $2\left[\cos\left(\frac{-5\pi}{6}\right) + i\sin\left(\frac{-5\pi}{6}\right)\right]$ · Official TGCHE final key

Q388 TS EAMCET 2019 · 4 May · Shift 2 MCQ

If $z = x + iy$ represents a point P in the Argand plane, then the area of the region represented by the inequality $2 < |z - (1+i)| < 3$ is

(A) 49π
(B) 36π
(C) 25π
(D) 5π

Answer: (D) 5π · Official TGCHE final key

Q389 TS EAMCET 2019 · 4 May · Shift 2 MCQ

If p is a complex number whose modulus is one, then the equation $\left(\frac{1+iz}{1-iz}\right)^4 = p$ has

(A) real and equal roots
(B) real and distinct roots
(C) two real and two complex roots
(D) all complex roots

Answer: (B) real and distinct roots · Official TGCHE final key

Q390 TS EAMCET 2019 · 4 May · Shift 2 MCQ

$\sum_{r=1}^{16}\left(\sin\frac{2r\pi}{17} + i\cos\frac{2r\pi}{17}\right) =$

(A) 1
(B) -1
(C) i
(D) $-i$

Answer: (D) $-i$ · Official TGCHE final key

Q391 TS EAMCET 2019 · 3 May · Shift 1 MCQ

If $x + iy = (1+i)^6 - (1-i)^6$, then which one of the following is true?

(A) $x + y = 16$
(B) $x + y = -16$
(C) $x + y = -8$
(D) $x + y = 8$

Answer: (B) $x + y = -16$ · Official TGCHE final key

Q392 TS EAMCET 2019 · 3 May · Shift 1 MCQ

$i^2 + i^3 + \ldots + i^{4000} =$

(A) 1
(B) 0
(C) i
(D) $-i$

Answer: (D) $-i$ · Official TGCHE final key

Q393 TS EAMCET 2019 · 3 May · Shift 1 MCQ

If $1, \omega$ and ω^2 are the cube roots of unity, then $(a+b+c)(a+b\omega+c\omega^2)(a+b\omega^2+c\omega) =$

(A) $a^3+b^3+c^3$
(B) $a^3+b^3+c^3-3abc$
(C) $(a+b+c)^3-3abc$
(D) $a^3+b^3+c^3+3abc$

Answer: (B) $a^3+b^3+c^3-3abc$ · Official TGCHE final key

Q394 TS EAMCET 2019 · 3 May · Shift 1 MCQ

If $a_k=\cos\alpha_k+i\sin\alpha_k$, $k=1,2,3$ and a_1,a_2,a_3 are the roots of the equation $x^3+bx+c=0$, then the real part of $b=$

(A) -1
(B) 1
(C) 0
(D) $\frac{2}{3}$

Answer: (C) 0 · Official TGCHE final key

Q395 TS EAMCET 2019 · 3 May · Shift 2 MCQ

If the amplitude of $(z-1-2i)$ is $\frac{\pi}{3}$, then the locus of z is

(A) $y=\sqrt{3}x+(2-\sqrt{3})$
(B) $y=\sqrt{3}x-\sqrt{3}$
(C) $x=\sqrt{3}y+(2-\sqrt{3})$
(D) $y=\sqrt{3}x+2$

Answer: (A) $y=\sqrt{3}x+(2-\sqrt{3})$ · Official TGCHE final key

Q396 TS EAMCET 2019 · 3 May · Shift 2 MCQ

If the point $\left(\frac{k-1}{k},\frac{k-2}{k}\right)$ lies on the locus of z satisfying the inequality $\left|\frac{z+3i}{3z+i}\right|<1$, then the interval in which k lies is

(A) $(-\infty,2)\cup(3,\infty)$
(B) $[2,3]$
(C) $[1,5]$
(D) $(-\infty,1)\cup(5,\infty)$

Answer: (D) $(-\infty,1)\cup(5,\infty)$ · Official TGCHE final key

Q397 TS EAMCET 2019 · 3 May · Shift 2 MCQ

If the complex cube roots of $(-i)$ are α,β,γ, then $\alpha^2+\beta^2+\gamma^2=$

(A) 1
(B) -1
(C) $-i$
(D) 0

Answer: (D) 0 · Official TGCHE final key

Q398 TS EAMCET 2019 · 3 May · Shift 2 MCQ

Imaginary part of $(\sqrt{3}-i)^{2016}+(-\sqrt{3}-i)^{2019}$ is

(A) 2^{2016}
(B) -2^{2016}
(C) -2^{2019}
(D) 2^{2019}

Answer: (C) -2^{2019} · Official TGCHE final key

Q399 TS EAMCET 2019 · 3 May · Shift 2 MCQ

If α and β are the roots of the equation $x^2-2x+4=0$, then $\alpha^{12}+\beta^{12}=$

(A) 2^{12}
(B) 2^{10}
(C) 2^{13}
(D) -2^{13}

Answer: (C) 2^{13} · Official TGCHE final key

Q400 AP EAMCET 2019 · 23 Apr · Shift 1 MCQ

For a complex number $Z=a+ib$, let $\hat{Z}=b+ia$. If Z_1, Z_2 are such complex numbers, then $\widehat{Z_1Z_2}=$

(A) $\hat{Z}_1\hat{Z}_2$
(B) $\hat{Z}_1\,\widehat{\hat{Z}_2}$
(C) $\overline{Z_1}\hat{Z}_2$
(D) $\hat{Z}_1 Z_2$

Answer: (C) $\overline{Z_1}\hat{Z}_2$ · Official APSCHE final key

Q401 AP EAMCET 2019 · 23 Apr · Shift 1 MCQ

The points in the Argand plane represented by the complex conjugates of $1+2i,\ 2-3i,\ 3-4i$

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(A) are collinear
(B) form an equilateral triangle
(C) form an obtuse angled triangle
(D) form an acute angled triangle

Answer: (C) form an obtuse angled triangle · Official APSCHE final key

Q402 AP EAMCET 2019 · 23 Apr · Shift 1 MCQ

If $1, \alpha_1, \alpha_2, \ldots, \alpha_{n-1}$ are the nth roots of unity and n is an even natural number, then $(1+\alpha_1)(1+\alpha_2)\ldots(1+\alpha_{n-1}) =$

(A) 1
(B) -1
(C) 0
(D) 2

Answer: (C) 0 · Official APSCHE final key

Q403 AP EAMCET 2019 · 23 Apr · Shift 1 MCQ

If $x + \frac{1}{x} = 2\sin\alpha$ and $y + \frac{1}{y} = 2\cos\beta$, then $x^3y^3 + \frac{1}{x^3y^3} =$

(A) $2\cos 3(\beta - \alpha)$
(B) $2\cos 3(\beta + \alpha)$
(C) $2\sin 3(\beta - \alpha)$
(D) $2\sin 3(\beta + \alpha)$

Answer: (C) $2\sin 3(\beta - \alpha)$ · Official APSCHE final key

Q404 AP EAMCET 2019 · 22 Apr · Shift 1 MCQ

If $z = x + iy,\ x, y \in \mathbb{R}$ and if the point P in the Argand plane represents z, then the locus of P satisfying the condition $\text{Arg}\left(\frac{z-1}{z-3i}\right) = \frac{\pi}{2}$ is

(A) $\left\{z \in C / \left|z - \frac{1+3i}{2}\right| = \frac{\sqrt{10}}{2}\right\}$
(B) $\{z \in C / (3-i)z + (3+i)\bar{z} - 6 = 0\}$
(C) $\left\{z \in C / (3-i)z + (3+i)\bar{z} - 6 > 0,\ \left|z - \frac{1+3i}{2}\right| = \frac{\sqrt{10}}{2}\right\}$
(D) $\left\{z \in C / (3-i)z + (3+i)\bar{z} - 6 < 0,\ \left|z - \frac{1+3i}{2}\right| = \frac{\sqrt{10}}{2}\right\}$

Answer: (C) $\left\{z \in C / (3-i)z + (3+i)\bar{z} - 6 > 0,\ \left|z - \frac{1+3i}{2}\right| = \frac{\sqrt{10}}{2}\right\}$ · Official APSCHE final key

Q405 AP EAMCET 2019 · 22 Apr · Shift 1 MCQ

If P, Q and R are points respectively representing the complex numbers $z,\ ze^{\frac{i\pi}{3}}$ and $z\left(1 + e^{\frac{i\pi}{3}}\right)$ in Argand plane, then the area of the triangle PQR is

(A) $\sqrt{3}|z|^2$
(B) $\frac{\sqrt{3}}{2}|z|^2$
(C) $\frac{\sqrt{3}}{4}|z|^2$
(D) $2\sqrt{3}|z|^2$

Answer: (C) $\frac{\sqrt{3}}{4}|z|^2$ · Official APSCHE final key

Q406 AP EAMCET 2019 · 22 Apr · Shift 1 MCQ

$A(z_1)$ and $B(z_2)$ are two points in the Argand plane. Then the locus of the complex number z satisfying $Arg\left(\frac{z-z_1}{z-z_2}\right) = 0$ or π, is

(A) The circle with $\overline{AB}$ as a diameter
(B) The ellipse with A, B as extremities of the major axis.
(C) The perpendicular bisector of $\overline{AB}$
(D) The straight line passing through the points A and B

Answer: (D) The straight line passing through the points A and B · Official APSCHE final key

Q407 AP EAMCET 2019 · 22 Apr · Shift 1 MCQ

If x is a cube root of unity other than 1, then, $\left(x+\frac{1}{x}\right)^2+\left(x^2+\frac{1}{x^2}\right)^2+\ldots+\left(x^{12}+\frac{1}{x^{12}}\right)^2=$

(A) 12
(B) 64
(C) 24
(D) 0

Answer: (C) 24 · Official APSCHE final key

Q408 AP EAMCET 2019 · 22 Apr · Shift 2 MCQ

$\left(\frac{2}{i+\sqrt{3}}\right)^{100}+\left(\frac{2}{i-\sqrt{3}}\right)^{100}=$

(A) 2
(B) 1
(C) -1
(D) -2

Answer: (C) -1 · Official APSCHE final key

Q409 AP EAMCET 2019 · 22 Apr · Shift 2 MCQ

If z is a complex number such that $\left|z-\frac{6}{z}\right|=5$, then the maximum value of $|z|$ is

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(A) 3
(B) 2
(C) 1
(D) $\frac{3}{2}$

Any attempt was accepted. Full marks for attempting. · Official APSCHE final key

Q410 AP EAMCET 2019 · 22 Apr · Shift 2 MCQ

If $a = 3 + 4i$, Z_1 and Z_2 are two complex numbers such that $|Z_1| = 3$ and $|Z_2 - a| = 2$, then the maximum value of $|Z_1 - Z_2|$ is

(A) 5
(B) 10
(C) 15
(D) 20

Answer: (B) 10 · Official APSCHE final key

Q411 AP EAMCET 2019 · 21 Apr · Shift 1 MCQ

If $z = x - iy$ and $z^{\frac{1}{3}} = a + ib$, then $\frac{\left(\frac{x}{a} + \frac{y}{b}\right)}{a^2 + b^2} =$

(A) -2
(B) -1
(C) 1
(D) 2

Answer: (A) -2 · Official APSCHE final key

Q412 AP EAMCET 2019 · 21 Apr · Shift 1 MCQ

The equation whose solutions are the non-zero solutions of the equation $\bar{z} = iz^2$, is

(A) $z^3 + i = 0$
(B) $z^3 + z + 1 = 0$
(C) $z^3 - i = 0$
(D) $z^3 + iz + 1 = 0$

Answer: (A) $z^3 + i = 0$ · Official APSCHE final key

Q413 AP EAMCET 2019 · 21 Apr · Shift 1 MCQ

If $x, y \in \mathbb{R}$ and $x^2 + y + 4i$ and $-3 + x^2yi$ are conjugates to each other, then $(|x| + |y|)^2 =$

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(A) 17
(B) 16
(C) 25
(D) 9

Answer: (C) 25 · Official APSCHE final key

Q414 AP EAMCET 2019 · 21 Apr · Shift 1 MCQ

$\sum_{k=1}^{6}\left(\sin\frac{2\pi k}{7}-i\cos\frac{2\pi k}{7}\right)=$

(A) -1
(B) 0
(C) i
(D) $-i$

Answer: (C) i · Official APSCHE final key

Q415 AP EAMCET 2019 · 21 Apr · Shift 2 MCQ

If a, b are the least and the greatest values respectively of $|z_1+z_2|$, where $z_1=12+5i$ and $|z_2|=9$, then $a^2+b^2=$

(A) 468
(B) 500
(C) 250
(D) 450

Answer: (B) 500 · Official APSCHE final key

Q416 AP EAMCET 2019 · 21 Apr · Shift 2 MCQ

If a complex number z is such that $(7+i)(z+\bar{z})-(4+i)(z-\bar{z})+116i=0$ then $z\,\bar{z}=$

(A) 400
(B) 300
(C) 200
(D) 100

Answer: (C) 200 · Official APSCHE final key

Q417 AP EAMCET 2019 · 21 Apr · Shift 2 MCQ

Let the point P represent $z=x+iy, x, y\in\mathbb{R}$ in the Argand plane. Let the curves C_1 and C_2 be the loci of P satisfying the conditions
(i) $\frac{2z+i}{z-2}$ is purely imaginary and (ii) $\operatorname{Arg}\left(\frac{z+i}{z+1}\right)=\frac{\pi}{2}$ respectively. Then the point of intersection of the curves C_1 and C_2, other than the origin, is

(A) $(1, 2)$
(B) $\left(\frac{2}{7}, -\frac{5}{7}\right)$
(C) $(-3, 4)$
(D) $\left(\frac{5}{37}, -\frac{30}{37}\right)$

Answer: (D) $\left(\frac{5}{37}, -\frac{30}{37}\right)$ · Official APSCHE final key

Q418 AP EAMCET 2019 · 20 Apr · Shift 1 MCQ

If $z = x + iy,\ x, y \in R,\ (x, y) \neq (0, -4)$ and $\text{Arg}\left(\frac{2z-3}{z+4i}\right) = \frac{\pi}{4}$, then the locus of z is

(A) $2x^2 + 2y^2 + 5x + 5y - 12 = 0$
(B) $2x^2 - 3xy + y^2 + 5x + y - 12 = 0$
(C) $2x^2 + 3xy + y^2 + 5x + y + 12 = 0$
(D) $2x^2 + 2y^2 - 11x + 7y - 12 = 0$

Answer: (A) $2x^2 + 2y^2 + 5x + 5y - 12 = 0$ · Official APSCHE final key

Q419 AP EAMCET 2019 · 20 Apr · Shift 1 MCQ

If $z = x + iy,\ x, y \in R$ and the imaginary part of $\frac{\bar{z}-1}{\bar{z}-i}$ is 1 then the locus of z is

(A) $x + y + 1 = 0$
(B) $x + y + 1 = 0,\ (x, y) \neq (0, -1)$
(C) $x^2 + y^2 - x + 3y + 2 = 0$
(D) $x^2 + y^2 - x + 3y + 2 = 0,\ (x, y) \neq (0, -1)$

Answer: (D) $x^2 + y^2 - x + 3y + 2 = 0,\ (x, y) \neq (0, -1)$ · Official APSCHE final key

Q420 AP EAMCET 2019 · 20 Apr · Shift 1 MCQ

If ω represents a complex cube root of unity, then $\left(1 + \frac{1}{\omega}\right)\left(1 + \frac{1}{\omega^2}\right) + \left(2 + \frac{1}{\omega}\right)\left(2 + \frac{1}{\omega^2}\right) + \ldots + \left(n + \frac{1}{\omega}\right)\left(n + \frac{1}{\omega^2}\right) =$

(A) $\frac{n(n^2+1)}{3}$
(B) $\frac{n(n^2+2)}{3}$
(C) $\frac{n(n^2-2)}{3}$
(D) $\frac{n^2(n-1)}{6}$

Answer: (B) $\frac{n(n^2+2)}{3}$ · Official APSCHE final key

Q421 AP EAMCET 2019 · 20 Apr · Shift 1 MCQ

If ω is a complex cube root of unity then $\sum_{r=1}^{9} r(r+1-\omega)(r+1-\omega^2) =$

(A) 5025
(B) 4020
(C) 2016
(D) 3015

Answer: (D) 3015 · Official APSCHE final key

Q422 AP EAMCET 2019 · 20 Apr · Shift 2 MCQ

z_1, z_2 are complex numbers with $|z_1 - z_2| < k$. If the complex number z satisfies the condition $|z - z_1| + |z - z_2| = k$, then z lies on

(A) a parabola
(B) an ellipse
(C) a circle
(D) a hyperbola

Answer: (B) an ellipse · Official APSCHE final key

Q423 AP EAMCET 2019 · 20 Apr · Shift 2 MCQ

In the complex plane $\mathbb{C}$, the set $\left\{z \in \mathbb{C} : \arg\left(\frac{z-1}{z+1}\right) = \frac{\pi}{4}\right\}$ represents

(A) a straight line
(B) a circle
(C) a parabola
(D) an ellipse

Answer: (B) a circle · Official APSCHE final key

Q424 AP EAMCET 2019 · 20 Apr · Shift 2 MCQ

For $a, b, c, d \in \mathbb{R}$, if $z_1 = a + ib$, $z_2 = c + id$ are such that $|z_1| = |z_2| = 1$ and $\mathrm{Re}(z_1\bar{z}_2) = 0$, then the pair of complex numbers $w_1 = a + ic$ and $w_2 = b + id$ satisfy

(A) $\mathrm{Re}(w_1\bar{w}_2) = 0$
(B) $\mathrm{Re}(w_1\bar{w}_2) = 1$
(C) $|w_1| \neq |w_2|$
(D) $|w_1| = |w_2| = 0$

Answer: (A) $\mathrm{Re}(w_1\bar{w}_2) = 0$ · Official APSCHE final key

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Q425 TS EAMCET 2018 · 7 May · Shift 1 MCQ

If $z = x + iy$ is a complex number satisfying $\left|\frac{z-2i}{z+2i}\right| = 2$ and the locus of z is a circle then its radius is

(A) $\frac{5}{3}$
(B) $\sqrt{\frac{71}{9}}$
(C) $\frac{8}{3}$
(D) $\frac{1}{3}$

Answer: (C) $\frac{8}{3}$ · The council's preliminary key

Q426 TS EAMCET 2018 · 7 May · Shift 1 MCQ

If $(x - iy)^{\frac{1}{3}} = a + ib$, then $\frac{ax - by}{a - b} =$

(A) $a^3 - b^3$
(B) $a^3 + a^2b + ab^2 + b^3$
(C) $a^3 + 3a^2b + 3ab^2 + b^3$
(D) $a^4 - b^4$

Answer: (B) $a^3 + a^2b + ab^2 + b^3$ · The council's preliminary key

Q427 TS EAMCET 2018 · 7 May · Shift 1 MCQ

If $z = x + iy$ is a complex number and $|1 + iz| = |1 - iz|$, then

(A) $\mathrm{Re}(z) > 0$
(B) $|z| = 1$
(C) $z = \bar{z}$
(D) $z = -\bar{z}$

Answer: (C) $z = \bar{z}$ · The council's preliminary key

Q428 TS EAMCET 2018 · 7 May · Shift 1 MCQ

The sum of the least positive arguments of the distinct cube roots of the complex number $(1 - i\sqrt{3})$ is

(A) $\frac{5\pi}{3}$
(B) $\frac{17\pi}{3}$
(C) $\frac{23\pi}{3}$
(D) $\frac{11\pi}{3}$

Answer: (D) $\frac{11\pi}{3}$ · The council's preliminary key

Q429 TS EAMCET 2018 · 5 May · Shift 1 MCQ

The common roots of the equations $z^3 + 2z^2 + 2z + 1 = 0$ and $z^{2018} + z^{2017} + 1 = 0$ satisfy the equation

(A) $z^2 - z + 1 = 0$
(B) $z^4 + z^2 + 1 = 0$
(C) $z^6 + z^3 + 1 = 0$
(D) $z^{12} + z^6 - 1 = 0$

Answer: (B) $z^4 + z^2 + 1 = 0$ · The council's preliminary key

Q430 TS EAMCET 2018 · 5 May · Shift 1 MCQ

The area (in sq. units) of the triangle whose vertices are the points represented by the complex numbers $0,\ z,\ ze^{i\alpha}\ (0 < \alpha < \pi)$ is

(A) $\frac{1}{2}|z|^2$
(B) $\frac{1}{2}|z|^2 \sin\alpha$
(C) $\frac{1}{2}|z|^2 \sin\alpha\cos\alpha$
(D) $\frac{1}{2}|z|^2 \cos\alpha$

Answer: (B) $\frac{1}{2}|z|^2 \sin\alpha$ · The council's preliminary key

Q431 TS EAMCET 2018 · 5 May · Shift 1 MCQ

If $z + \frac{1}{z} = 1$, then $\frac{(z^{20}+1)(z^{40}+1)(z^{60}+1)}{z^{60}} =$

(A) -2
(B) 2
(C) 1
(D) -1

Answer: (B) 2 · The council's preliminary key

Q432 TS EAMCET 2018 · 5 May · Shift 1 MCQ

If $\omega_0, \omega_1, \ldots, \omega_{n-1}$ are the nth roots of unity, then $(1 + 2\omega_0)(1 + 2\omega_1)(1 + 2\omega_2)\ldots(1 + 2\omega_{n-1}) =$

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(A) $1+(-1)^n 2^n$

(B) $1+2^n$

(C) $(-1)^n+2^n$

(D) $1+(-1)^{n-1}2^n$

Answer: (D) $1+(-1)^{n-1}2^n$ · The council's preliminary key

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Q433 TS EAMCET 2018 · 5 May · Shift 2 MCQ

The modulus-amplitude form of $\frac{(1-i)^3(2-i)}{(2+i)(1+i)}$ is

(A) $2\,\text{cis}\left(\pi-\text{Tan}^{-1}\frac{4}{3}\right)$

(B) $2\,\text{cis}\left(-\text{Tan}^{-1}\frac{4}{3}\right)$

(C) $2\,\text{cis}\left(-\pi+\text{Tan}^{-1}\frac{4}{3}\right)$

(D) $2\,\text{cis}\left(\text{Tan}^{-1}\frac{4}{3}\right)$

Answer: (A) $2\,\text{cis}\left(\pi-\text{Tan}^{-1}\frac{4}{3}\right)$ · The council's preliminary key

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Q434 TS EAMCET 2018 · 5 May · Shift 2 MCQ

If $z_1=2-3i$ and $z_2=-1+i$, then the locus of a point P represented by $z=x+iy$ in the Argand plane satisfying the equation $\text{Arg}\left(\frac{z-z_1}{z-z_2}\right)=\frac{\pi}{2}$ is

(A) $x^2+y^2-x+2y-5=0$

(B) $x^2+y^2-x+2y-5=0$ and $4x+3y+1<0$

(C) $4x+3y+1=0$ and $x^2+y^2-x+2y-5>0$

(D) $x^2+y^2-x+2y-5=0$ and $4x+3y+1>0$

Answer: (D) $x^2+y^2-x+2y-5=0$ and $4x+3y+1>0$ · The council's preliminary key

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Q435 TS EAMCET 2018 · 5 May · Shift 2 MCQ

$$\left(\frac{1+\cos\frac{\pi}{8}-i\sin\frac{\pi}{8}}{1+\cos\frac{\pi}{8}+i\sin\frac{\pi}{8}}\right)^{12}=$$

(A) -1

(B) i

(C) $-i$

(D) 2

Answer: (B) i · The council's preliminary key

Q436 TS EAMCET 2018 · 5 May · Shift 2 MCQ

If the complex number a is such that $|a| = 1$, and $\arg(a) = \theta$ then the roots of the equation $\left(\frac{1+iz}{1-iz}\right)^4 = a$ are $z =$

(A) $\tan\left(\frac{2k\pi+\theta}{4}\right), k = 0, 1, 2, 3$

(B) $\tan\left(\frac{k\pi+\theta}{8}\right), k = 0, 1, 2, 3$

(C) $\tan\left(\frac{3k\pi+\theta}{4}\right), k = 0, 1, 2, 3$

(D) $\tan\left(\frac{2k\pi+\theta}{8}\right), k = 0, 1, 2, 3$

Answer: (D) $\tan\left(\frac{2k\pi+\theta}{8}\right), k = 0, 1, 2, 3$ · The council's preliminary key

Q437 TS EAMCET 2018 · 4 May · Shift 1 MCQ

Z is a complex number such that $|Z| \leq 2$ and $-\frac{\pi}{3} \leq \text{amp } Z \leq \frac{\pi}{3}$. The area of the region formed by locus of Z is

(A) $\frac{2\pi}{3}$

(B) $\frac{\pi}{3}$

(C) $\frac{4\pi}{3}$

(D) $\frac{8\pi}{3}$

Answer: (C) $\frac{4\pi}{3}$ · The council's preliminary key

Q438 TS EAMCET 2018 · 4 May · Shift 1 MCQ

The points in the argand plane given by $Z_1 = -3 + 5i$, $Z_2 = -1 + 6i$, $Z_3 = -2 + 8i$, $Z_4 = -4 + 7i$ from a (sic)

(A) parallelogram

(B) rectangle

(C) rhombus

(D) square

Answer: (D) square · The council's preliminary key

Q439 TS EAMCET 2018 · 4 May · Shift 1 MCQ

When $n = 8$, $(\sqrt{3}+i)^n + (\sqrt{3}-i)^n =$

(A) -256

(B) -128

(C) $256\,i$

(D) $128\,i$

Answer: (A) -256 · The council's preliminary key

Q440 TS EAMCET 2018 · 4 May · Shift 1 MCQ

If $2\,\mathrm{cis}\dfrac{7\pi}{5}$ is one of the values of $z^{1/5}$, then $z =$

(A) $32 + 32i$

(B) -32

(C) -1

(D) 32

Answer: (B) -32 · The council's preliminary key

Q441 TS EAMCET 2018 · 4 May · Shift 2 MCQ

If $\dfrac{1 - 10i\cos\theta}{1 - 10\sqrt{3}\,i\sin\theta}$ is purely real, then one of the values of θ is

(A) $\frac{\pi}{6}$

(B) $\frac{\pi}{4}$

(C) $\frac{\pi}{3}$

(D) $\frac{\pi}{2}$

Answer: (A) $\frac{\pi}{6}$ · The council's preliminary key

Q442 TS EAMCET 2018 · 4 May · Shift 2 MCQ

If z and w are complex numbers such that $\bar{z} - i\bar{w} = 0$ and $\mathrm{Arg}(zw) = \frac{3\pi}{4}$, then $\mathrm{Arg}\,z =$

(A) $\frac{\pi}{16}$

(B) $\frac{\pi}{8}$

(C) $\frac{\pi}{4}$

(D) $\frac{3\pi}{4}$

Answer: (B) $\frac{\pi}{8}$ · The council's preliminary key

Q443 TS EAMCET 2018 · 4 May · Shift 2 MCQ

The number of complex roots of the equation $x^{11} - x^7 + x^4 - 1 = 0$ whose arguments lie in the first quadrant is

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(A) 2
(B) 3
(C) 7
(D) 9

Answer: (A) 2 · Checked by our team

Q444 TS EAMCET 2018 · 4 May · Shift 2 MCQ

If α is a root of $z^2 - z + 1 = 0$ then $\left(\alpha^{2014} + \frac{1}{\alpha^{2014}}\right) + \left(\alpha^{2015} + \frac{1}{\alpha^{2015}}\right)^2 + \left(\alpha^{2016} + \frac{1}{\alpha^{2016}}\right)^3 + \left(\alpha^{2017} + \frac{1}{\alpha^{2017}}\right)^4 + \left(\alpha^{2018} + \frac{1}{\alpha^{2018}}\right)^5 =$

(A) 8
(B) 5
(C) 3
(D) -5

Answer: (A) 8 · The council's preliminary key

Q445 AP EAMCET 2018 · 24 Apr · Shift 1 MCQ

The maximum value of the modulus of e^{z^2} on the set $\{z \in C/0 \leq \mathrm{Re}(z) \leq 1, 0 \leq \mathrm{Im}(z) \leq 1\}$ is

(A) $\frac{2}{e}$
(B) e
(C) $e + 1$
(D) e^2

Answer: (B) e · The council's preliminary key

Q446 AP EAMCET 2018 · 24 Apr · Shift 1 MCQ

If $Z \neq \pm 1$ is a complex number and $\mathrm{Arg}\left(\frac{Z-1}{Z+1}\right) = \frac{\pi}{4}$, then the locus of Z in the Argand plane is

(A) $x^2 + y^2 - 2y - 1 = 0$
(B) $x^2 + y^2 + 2y - 1 = 0$
(C) $x^2 + y^2 - 2x + 1 = 0$
(D) $x^2 + y^2 + 2x + 1 = 0$

Answer: (A) $x^2 + y^2 - 2y - 1 = 0$ · The council's preliminary key

Q447 AP EAMCET 2018 · 24 Apr · Shift 1 MCQ

One of the complex roots of the equation $x^{11} - x^6 - x^5 + 1 = 0$ is

(A) $\text{cis}\frac{3\pi}{5}$
(B) $\text{cis}\frac{\pi}{3}$
(C) $\text{cis}\frac{5\pi}{6}$
(D) $\text{cis}\frac{7\pi}{5}$

Answer: (B) $\text{cis}\frac{\pi}{3}$ · The council's preliminary key

Q448 AP EAMCET 2018 · 24 Apr · Shift 2 MCQ

If ω is a complex cube root of unity and a, b, c are distinct real numbers, then $\frac{a+b\omega+c\omega^2}{c+a\omega+b\omega^2} + \frac{a+b\omega+c\omega^2}{b+c\omega+a\omega^2} =$

(A) 1
(B) -1
(C) $a+b+c$
(D) 0

Answer: (B) -1 · The council's preliminary key

Q449 AP EAMCET 2018 · 24 Apr · Shift 2 MCQ

If $z = x + iy$ and $z^2 = (i\bar{z})^2$, then

(A) $y = \pm\frac{x}{\sqrt{3}}$
(B) $y = \pm x$
(C) $y = \pm\frac{x}{2}$
(D) $x = 0,\ y = \pm 1$

Answer: (B) $y = \pm x$ · The council's preliminary key

Q450 AP EAMCET 2018 · 24 Apr · Shift 2 MCQ

If $z = \frac{1}{1-\cos\theta+i\sin\theta}$ and θ is acute then the modulus and amplitude of z respectively are

(A) $\frac{1}{2}\text{cosec}\frac{\theta}{2},\ -\left(\frac{\pi}{2}-\frac{\theta}{2}\right)$
(B) $\frac{1}{2}\text{cosec}\frac{\theta}{2},\ \left(\frac{\pi}{2}+\frac{\theta}{2}\right)$
(C) $\frac{1}{2}\sec\frac{\theta}{2},\ -\left(\frac{\pi}{2}+\frac{\theta}{2}\right)$
(D) $\frac{1}{2}\sec\frac{\theta}{2},\ \left(\frac{\pi}{2}+\frac{\theta}{2}\right)$

Answer: (A) $\frac{1}{2}\text{cosec}\frac{\theta}{2},\ -\left(\frac{\pi}{2}-\frac{\theta}{2}\right)$ · The council's preliminary key

Q451 AP EAMCET 2018 · 24 Apr · Shift 2 MCQ

If $\alpha_1, \alpha_2, \alpha_3, \ldots, \alpha_n$ are real numbers, $\alpha_1 \neq 0$ and $z = \cos\theta + i\sin\theta$ is a root of the equation $\alpha_1 + \alpha_2 z + \alpha_3 z^2 + \ldots + \alpha_n z^{n-1} + z^n = 0$, then $\alpha_1\cos n\theta + \alpha_2\cos(n-1)\theta + \ldots + \alpha_n\cos\theta =$

(A) $1+i$
(B) 1
(C) -1
(D) $1-i$

Answer: (C) -1 · The council's preliminary key

Q452 AP EAMCET 2018 · 23 Apr · Shift 1 MCQ

If $z=\frac{\sqrt{3}+i}{2}$ then $\left(z^{101}+i^{103}\right)^{105}=$

(A) z
(B) z^2
(C) z^3
(D) $-z$

Answer: (C) z^3 · The council's preliminary key

Q453 AP EAMCET 2018 · 23 Apr · Shift 1 MCQ

If $u+iv=\frac{3i}{x+iy+2}$, then $y=$

(A) $\frac{9u}{u^2+v^2}$
(B) $\frac{3u}{u^2+v^2}$
(C) $\frac{6u}{u^2+v^2}$
(D) $\frac{12u}{u^2+v^2}$

Answer: (B) $\frac{3u}{u^2+v^2}$ · The council's preliminary key

Q454 AP EAMCET 2018 · 23 Apr · Shift 1 MCQ

Let $A(3-i)$, $B(2+i)$ be two points in the Argand plane. If the point P represents the complex number $z=x+iy$, which satisfies $|z-3+i|=|z-2-i|$, then the locus of the point P is

(A) the circle with AB as diameter
(B) the line passing through A and B
(C) the perpendicular bisector of AB
(D) the ellipse with AB as major axis

Answer: (C) the perpendicular bisector of AB · The council's preliminary key

Q455 AP EAMCET 2018 · 23 Apr · Shift 1 MCQ

If $a=\cos\left(\frac{8\pi}{11}\right)+i\sin\left(\frac{8\pi}{11}\right)$, then $\mathrm{Re}\left(a+a^2+a^3+a^4+a^5\right)=$

(A) 0
(B) $-\frac{1}{2}$
(C) $\frac{1}{2}$
(D) 1

Answer: (B) $-\frac{1}{2}$ · The council's preliminary key

Q456 AP EAMCET 2018 · 23 Apr · Shift 2 MCQ

If a complex number z satisfies $|z|^2+1=|z^2-1|$ then the locus of z is

(A) a circle
(B) the real axis
(C) the imaginary axis
(D) the straight line $y=x$

Answer: (C) the imaginary axis · The council's preliminary key

Q457 AP EAMCET 2018 · 23 Apr · Shift 2 MCQ

P is a point denoting z in the Argand diagram and if $\frac{z-i}{z-1}$ is always purely imaginary, then the locus of P is

(A) The circle with centre $\left(\frac{1}{2},\frac{1}{2}\right)$ and radius $\frac{1}{\sqrt{2}}$
(B) The circle with centre $\left(-\frac{1}{2},-\frac{1}{2}\right)$ and radius $\frac{1}{\sqrt{2}}$
(C) The points on the circle with centre $\left(\frac{1}{2},\frac{1}{2}\right)$ and radius $\frac{1}{\sqrt{2}}$, excluding the points $(1,0)$ and $(0,1)$
(D) The points on the circle with centre $\left(-\frac{1}{2},-\frac{1}{2}\right)$ and radius $\frac{1}{\sqrt{2}}$, excluding the origin

Answer: (C) The points on the circle with centre $\left(\frac{1}{2},\frac{1}{2}\right)$ and radius $\frac{1}{\sqrt{2}}$, excluding the points $(1,0)$ and $(0,1)$ · The council's preliminary key

Q458 AP EAMCET 2018 · 23 Apr · Shift 2 MCQ

If a,b,c are non-zero real numbers with $c\neq 1$ such that $a^2+b^2+c^2=c$ and if $\alpha=\frac{a+ib}{1-c}$ then $a^2+b^2=$

(A) $\frac{|\alpha|^2}{(1+|\alpha|^2)^2}$
(B) $\frac{|\alpha|^4}{(1+|\alpha|^2)^2}$
(C) $\frac{|\alpha|}{1+|\alpha|^2}$
(D) $\frac{|\alpha|}{1+|\alpha|}$

Answer: (A) $\frac{|\alpha|^2}{(1+|\alpha|^2)^2}$ · The council's preliminary key

Q459 AP EAMCET 2018 · 23 Apr · Shift 2 MCQ

For $n\in\mathbb{Z}^+$, $(1+\sin\theta+i\cos\theta)^n+(1+\sin\theta-i\cos\theta)^n=$

(A) $2^{n+1}\cdot\cos^n\left(\frac{\pi}{4}-\frac{\theta}{2}\right)\cos\left(\frac{n\pi}{4}-\frac{\theta}{2}\right)$
(B) $2^{n+1}\cdot\cos^n\left(\frac{\pi}{4}-\frac{\theta}{2}\right)\cdot\sin\left(\frac{n\pi}{4}-\frac{\theta}{2}\right)$
(C) $2^{n+1}\cdot\cos^n\left(\frac{\pi}{4}-\frac{\theta}{2}\right)\cos\left(\frac{n\pi}{4}-\frac{n\theta}{2}\right)$
(D) $2^{n+1}\cdot\cos^n\left(\frac{\pi}{4}-\frac{\theta}{2}\right)\sin\left(\frac{n\pi}{4}-\frac{n\theta}{2}\right)$

Answer: (C) $2^{n+1}\cdot\cos^n\left(\frac{\pi}{4}-\frac{\theta}{2}\right)\cos\left(\frac{n\pi}{4}-\frac{n\theta}{2}\right)$ · The council's preliminary key

Q460 AP EAMCET 2018 · 22 Apr · Shift 1 MCQ

Let $z=x+iy$ and a point P represent z in the Argand plane. If the real part of $\frac{z-1}{z+i}$ is 1, then a point that lies on the locus of P is

(A) $(2016, 2017)$
(B) $(-2016, 2017)$
(C) $(-2016, -2017)$
(D) $(2016, -2017)$

Answer: (D) $(2016, -2017)$ · The council's preliminary key

Q461 AP EAMCET 2018 · 22 Apr · Shift 1 MCQ

If $13e^{i\,\mathrm{Tan}^{-1}\frac{5}{12}}=a+ib$, then the ordered pair $(a,b)=$

(A) $(12, 5)$
(B) $(5, 12)$
(C) $(24, 10)$
(D) $(10, 24)$

Answer: (A) $(12, 5)$ · The council's preliminary key

Q462 AP EAMCET 2018 · 22 Apr · Shift 1 MCQ

If $z_1=1-2i$; $z_2=1+i$ and $z_3=3+4i$, then $\left(\frac{1}{z_1}+\frac{3}{z_2}\right)\frac{z_3}{z_2}=$

(A) $13-6i$
(B) $13-3i$
(C) $6-\frac{13}{2}i$
(D) $\frac{13}{2}-3i$

Answer: (D) $\frac{13}{2}-3i$ · The council's preliminary key

Q463 AP EAMCET 2018 · 22 Apr · Shift 1 MCQ

If $1, \omega, \omega^2$ are the cube roots of unity, then $\frac{1}{1+2\omega}+\frac{1}{2+\omega}-\frac{1}{1+\omega}=$

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(A) 1
(B) ω
(C) ω^2
(D) 0

Answer: (D) 0 · The council's preliminary key

Q464 AP EAMCET 2018 · 22 Apr · Shift 2 MCQ

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

(A) $\frac{\pi}{15}$
(B) $\frac{\pi}{10}$
(C) $\frac{\pi}{5}$
(D) $\frac{2\pi}{5}$

Answer: (B) $\frac{\pi}{10}$ · The council's preliminary key

Q465 AP EAMCET 2018 · 22 Apr · Shift 2 MCQ

If a point P denotes a complex number $z=x+iy$ in the Argand plane and if $\frac{z+1}{z+i}$ is a purely real number, then the locus of P is

(A) $x+y+1=0$
(B) $x^2+y^2+x+y=0$
(C) $x^2+y^2+2y+1=0,\ (x,y)\neq(0,-1)$
(D) $x+y+1=0,\ (x,y)\neq(0,-1)$

Answer: (D) $x+y+1=0,\ (x,y)\neq(0,-1)$ · The council's preliminary key

Q466 AP EAMCET 2018 · 22 Apr · Shift 2 MCQ

If ω is a complex cube root of unity, then $\left[\frac{51+73\omega+87\omega^2}{73+87\omega+51\omega^2}+\frac{51+73\omega+87\omega^2}{87+51\omega+73\omega^2}\right]^{15}=$

(A) 1
(B) -1
(C) 0
(D) 2

Answer: (B) -1 · The council's preliminary key

Q467 TS EAMCET 2017 · 12 May · Offline MCQ

If the conjugate of $(x+iy)(1-2i)$ is $(1+i)$, then

(A) $x + iy = 1 - i$

(B) $x + iy = \dfrac{1 - i}{1 - 2i}$

(C) $x - iy = \dfrac{1 - i}{1 + 2i}$

(D) $x - iy = \dfrac{1 - i}{1 + i}$

Answer: (B) $x + iy = \dfrac{1 - i}{1 - 2i}$ · The council's preliminary key

Q468 TS EAMCET 2017 · 12 May · Offline MCQ

The sum of the complex roots of the equation $(x - 1)^3 + 64 = 0$ is

(A) 6

(B) 3

(C) $6i$

(D) $3i$

Answer: (A) 6 · The council's preliminary key

Q469 TS EAMCET 2017 · 12 May · Offline MCQ

If the imaginary part of $\dfrac{2z + 1}{iz + 1}$ is -2, then the locus of the point representing z in the complex plane is

(A) a circle

(B) a parabola

(C) a straight line

(D) an ellipse

Answer: (C) a straight line · The council's preliminary key

Q470 TS EAMCET 2017 · 12 May · Offline MCQ

$$\left[\frac{1 + \cos\left(\frac{\pi}{12}\right) + i\sin\left(\frac{\pi}{12}\right)}{1 + \cos\left(\frac{\pi}{12}\right) - i\sin\left(\frac{\pi}{12}\right)}\right]^{72} =$$

(A) 0

(B) -1

(C) 1

(D) $\dfrac{1}{2}$

Answer: (C) 1 · The council's preliminary key

Q471 AP EAMCET 2017 · 26 Apr · Shift 1 MCQ

If z is a complex number with $|z| \geq 5$, then the least value of $\left|z + \frac{2}{z}\right|$ is

(A) $\frac{23}{5}$
(B) $\frac{24}{5}$
(C) $\frac{26}{5}$
(D) $\frac{29}{5}$

Answer: (A) $\frac{23}{5}$ · The council's preliminary key

Q472 AP EAMCET 2017 · 26 Apr · Shift 1 MCQ

If $\log_{\frac{1}{\sqrt{3}}}\left\{\frac{|z|^2 - |z| + 1}{2 + |z|}\right\} > -2$, then z lies inside

(A) a square
(B) a triangle
(C) a circle
(D) an ellipse

Answer: (C) a circle · The council's preliminary key

Q473 AP EAMCET 2017 · 26 Apr · Shift 1 MCQ

If ω is a complex cube root of unity, then for any $n > 1$, $\sum_{r=1}^{n-1} r(r + 1 - \omega)(r + 1 - \omega^2) =$

(A) $\frac{n^2(n+1)^2}{4}$
(B) $\frac{n(n-1)}{4}(n^2 + 3n + 4)$
(C) $\frac{n(n+1)(2n+1)}{4}$
(D) $\frac{n(n+1)(2n+1)}{6}$

Answer: (B) $\frac{n(n-1)}{4}(n^2 + 3n + 4)$ · The council's preliminary key

Q474 AP EAMCET 2017 · 26 Apr · Shift 1 MCQ

If α is a non-real root of $x^7 = 1$, then $\alpha(1 + \alpha)(1 + \alpha^2 + \alpha^4) =$

(A) 2
(B) -1
(C) 1
(D) -2

Answer: (B) -1 · The council's preliminary key

Q475 AP EAMCET 2017 · 26 Apr · Shift 2 MCQ

The points P, Q denote the complex numbers Z_1, Z_2 in the Argand plane. 'O' is the origin. $Z_1\bar{Z}_2 + \bar{Z}_1 Z_2 = 0$ and $\angle POQ = \theta$ then $\sin\theta =$

(A) 1
(B) $\frac{1}{2}$
(C) $\frac{\sqrt{3}}{2}$
(D) $\frac{1}{\sqrt{2}}$

Answer: (A) 1 · The council's preliminary key

Q476 AP EAMCET 2017 · 26 Apr · Shift 2 MCQ

If $Z \neq 0$ is a complex number such that $Z^2 + Z|Z| + |Z|^2 = 0$ then Z is in the set (Here ω is a complex cube root of unity)

(A) $\{1\}$
(B) $\{i, -i\}$
(C) $\{\omega, \omega^2\}$
(D) ϕ

Answer: (C) $\{\omega, \omega^2\}$ · The council's preliminary key

Q477 AP EAMCET 2017 · 26 Apr · Shift 2 MCQ

If $z_1 = -\sqrt{3} + i$ and $z_2 = -\sqrt{3} - i$ then the principal amplitude of the complex number $\frac{z_1}{z_2}$ is

(A) $\frac{\pi}{3}$
(B) $\frac{5\pi}{6}$
(C) $\frac{-\pi}{3}$
(D) $\frac{5\pi}{3}$

Answer: (C) $\frac{-\pi}{3}$ · The council's preliminary key

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Q478 AP EAMCET 2017 · 25 Apr · Shift 1 MCQ

If $\frac{2+3i\sin\theta}{1-2i\sin\theta}$ is purely imaginary, then $\cos^2\theta =$

(A) $\frac{1}{2}$
(B) $\frac{3}{2}$
(C) $\frac{1}{3}$
(D) $\frac{2}{3}$

Answer: (D) $\frac{2}{3}$ · The council's preliminary key

Q479 AP EAMCET 2017 · 25 Apr · Shift 1 MCQ

Let A and B represent z_1 and z_2 in the Argand plane and z_1, z_2 be the roots of the equation $Z^2 + pZ + q = 0$, where p, q are complex numbers. If O is the origin, $OA = OB$ and $\angle AOB = \alpha$, then $p^2 =$

(A) $2q\cos\left(\frac{\alpha}{2}\right)$
(B) $4q\cos\left(\frac{\alpha}{2}\right)$
(C) $4q\cos^2\left(\frac{\alpha}{2}\right)$
(D) $4q^2\cos^2\left(\frac{\alpha}{2}\right)$

Answer: (C) $4q\cos^2\left(\frac{\alpha}{2}\right)$ · The council's preliminary key

Q480 AP EAMCET 2017 · 25 Apr · Shift 1 MCQ

Consider the following statements :
I : If a and b are positive real numbers, then $\sqrt{-a}\times\sqrt{-b} = \sqrt{ab}$
II : The argument of $\frac{1+i\sqrt{3}}{1-i\sqrt{3}}$ is 120°
Then

(A) Only I is true
(B) Only II is true
(C) Both I and II are true
(D) Neither I nor II is true

Answer: (B) Only II is true · The council's preliminary key

Q481 AP EAMCET 2017 · 25 Apr · Shift 1 MCQ

If α is a non-real root of the equation $x^6 - 1 = 0$ then $\frac{\alpha^2+\alpha^3+\alpha^4+\alpha^5}{\alpha+1} =$

(A) α
(B) 1
(C) 0
(D) -1

Answer: (D) -1 · The council's preliminary key

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Q482 AP EAMCET 2017 · 25 Apr · Shift 2 MCQ

If a and c are complex numbers and b is a real number in the Argand plane, then the perpendicular distance from c to the line $a\bar{z} + \bar{a}z + b = 0$ is

(A) $\dfrac{a\bar{c} + \bar{a}c + b}{2|a|}$

(B) $\dfrac{\bar{a}\,\bar{c} + ac + b}{2|a|}$

(C) $\dfrac{a\bar{c} + \bar{a}c + b}{|a|}$

(D) $\dfrac{\bar{a} + b + \bar{c}}{2|a|}$

Answer: (A) $\dfrac{a\bar{c} + \bar{a}c + b}{2|a|}$ · The council's preliminary key

Q483 AP EAMCET 2017 · 25 Apr · Shift 2 MCQ

The real part of the complex number $z = \dfrac{5+2i}{2-5i} - \dfrac{3-4i}{4+3i} - \dfrac{1}{i}$, is

(A) 2

(B) 0

(C) 3

(D) 4

Answer: (B) 0 · The council's preliminary key

Q484 AP EAMCET 2017 · 25 Apr · Shift 2 MCQ

If z, iz and $z + iz$ are the vertices of a triangle and if $|z| = 4$, then the area (in sq. units) of the triangle, is

(A) 4

(B) 8

(C) 16

(D) 32

Answer: (B) 8 · The council's preliminary key

Q485 AP EAMCET 2017 · 25 Apr · Shift 2 MCQ

$$\sum_{n=1}^{20}\left[\sin\left(\frac{2n\pi}{21}\right) - i\cos\left(\frac{2n\pi}{21}\right)\right] =$$

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(A) 1
(B) -1
(C) i
(D) $-i$

Answer: (C) i · The council's preliminary key

Q486 AP EAMCET 2017 · 24 Apr · Shift 1 MCQ

If ω is a complex cube root of unity, then $\sum_{k=1}^{6}\left(\omega^k+\frac{1}{\omega^k}\right)^2=$

(A) 6
(B) 8
(C) 12
(D) 24

Answer: (C) 12 · The council's preliminary key

Q487 AP EAMCET 2017 · 24 Apr · Shift 1 MCQ

In Argand plane, the quadrant in which $\frac{1+2i}{1-i}$ lies is

(A) First
(B) Second
(C) Third
(D) Fourth

Answer: (B) Second · The council's preliminary key

Q488 AP EAMCET 2017 · 24 Apr · Shift 1 MCQ

If $z=x+iy$ and if the point P in the Argand plane represents z, then the locus of P satisfying the equation $|z-3i|+|z+3i|=10$ is

(A) Circle with centre $(-3,3)$
(B) Hyperbola with eccentricity $\frac{5}{3}$
(C) Ellipse with eccentricity $\frac{3}{5}$
(D) Ellipse with eccentricity $\frac{4}{5}$

Answer: (C) Ellipse with eccentricity $\frac{3}{5}$ · The council's preliminary key

Q489 AP EAMCET 2017 · 24 Apr · Shift 1 MCQ

If α,β are the roots of the equation $x^2-2x+4=0$ and for any $n\in\mathrm{N}$, $\alpha^n+\beta^n=k\cos\frac{n\pi}{3}$ then $k=$

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(A) 2^n

(B) 2^{n+1}

(C) $2^n - 1$

(D) $2^n + 1$

Answer: (B) 2^{n+1} · The council's preliminary key

Q490 AP EAMCET 2017 · 24 Apr · Shift 2 MCQ

If $(x+iy)^{\frac{1}{3}} = 5 + 3i$, then $3x + 5y =$

(A) 480

(B) 152

(C) 990

(D) 960

Answer: (D) 960 · The council's preliminary key

Q491 AP EAMCET 2017 · 24 Apr · Shift 2 MCQ

If $z = \left(\frac{\sqrt{3}+i}{2}\right)^5 + \left(\frac{\sqrt{3}-i}{2}\right)^5$, then

(A) $Re(z) > 0,\ Im(z) < 0$

(B) $Re(z) > 0,\ Im(z) > 0$

(C) $Re(z) = 0$

(D) $Im(z) = 0$

Answer: (D) $Im(z) = 0$ · The council's preliminary key

Q492 AP EAMCET 2017 · 24 Apr · Shift 2 MCQ

Match the items of List - I with those of List - II

List - I (Complex number)

i) $\sqrt{3} - i$

ii) $\sqrt{3} + i$

iii) $-\sqrt{3} + i$

iv) $-\sqrt{3} - i$

List - II (Polar form)

a) $2\,\mathrm{cis}\frac{\pi}{6}$

b) $2\,\mathrm{cis}\frac{5\pi}{6}$

c) $2\,\mathrm{cis}\left(\frac{-5\pi}{6}\right)$

d) $2\,\mathrm{cis}\left(-\frac{\pi}{6}\right)$

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e) $2\,\mathrm{cis}\dfrac{9\pi}{6}$

The correct matching is

(A) i-d, ii-b, iii-a, iv-e

(B) i-d, ii-a, iii-b, iv-c

(C) i-b, ii-d, iii-a, iv-c

(D) i-b, ii-c, iii-a, iv-d

Answer: (B) i-d, ii-a, iii-b, iv-c · The council's preliminary key

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Q493 TS EAMCET 2016 · 15 May · Offline MCQ

If $z = x + iy$ is a complex number such that $\bar{z}^{1/3} = a + ib$, then the value of $\frac{1}{a^2+b^2}\left(\frac{x}{a} + \frac{y}{b}\right) =$

(A) -1

(B) -2

(C) 0

(D) 2

Answer: (B) -2 · Official TGCHE final key

Q494 TS EAMCET 2016 · 15 May · Offline MCQ

The locus of z satisfying $|z| + |z-1| = 3$ is

(A) a circle

(B) a pair of straight lines

(C) an ellipse

(D) a parabola

Answer: (C) an ellipse · Official TGCHE final key

Q495 TS EAMCET 2016 · 15 May · Offline MCQ

If the point $z = (1+i)(1+2i)(1+3i)\ldots(1+10i)$ lies on a circle with centre at origin and radius r, then $r^2 =$

(A) $10!$

(B) $2 \times 3 \times 4 \times \ldots \times 10$

(C) $2 \times 5 \times 10 \times \ldots \times 101$

(D) $11!$

Answer: (C) $2 \times 5 \times 10 \times \ldots \times 101$ · Official TGCHE final key

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Q496 TS EAMCET 2016 · 15 May · Offline MCQ

The minimum value of $|z-1| + |z-5|$ is

(A) 5
(B) 4
(C) 3
(D) 2

Answer: (B) 4 · Official TGCHE final key

Q497 TS EAMCET 2016 · 15 May · Offline MCQ

If α, β are the roots of $x^2 - x + 1 = 0$ then the quadratic equation whose roots are $\alpha^{2015}, \beta^{2015}$ is

(A) $x^2 - x + 1 = 0$
(B) $x^2 + x + 1 = 0$
(C) $x^2 + x - 1 = 0$
(D) $x^2 - x - 1 = 0$

Answer: (A) $x^2 - x + 1 = 0$ · Official TGCHE final key

Q498 AP EAMCET 2016 · 29 Apr · Offline MCQ

The locus of the point representing the complex number z for which $|z+3|^2 - |z-3|^2 = 15$ is

(A) a circle
(B) a parabola
(C) a straight line
(D) an ellipse

Answer: (C) a straight line · The council's preliminary key

Q499 AP EAMCET 2016 · 29 Apr · Offline MCQ

$\frac{(1+i)^{2016}}{(1-i)^{2014}} =$

(A) $-2i$
(B) $2i$
(C) 2
(D) -2

Answer: (A) $-2i$ · The council's preliminary key

Q500 AP EAMCET 2016 · 29 Apr · Offline MCQ

If $|z_1| = 1, |z_2| = 2, |z_3| = 3$ and $|9z_1z_2 + 4z_1z_3 + z_2z_3| = 12$, then the value of $|z_1 + z_2 + z_3|$ is

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(A) 3
(B) 4
(C) 8
(D) 2

Answer: (D) 2 · The council's preliminary key

Q501 AP EAMCET 2016 · 29 Apr · Offline MCQ

If $1, z_1, z_2, \ldots, z_{n-1}$ are the nth roots of unity, then $(1-z_1)(1-z_2)\ldots(1-z_{n-1}) =$

(A) 0
(B) $n-1$
(C) n
(D) 1

Answer: (C) n · The council's preliminary key

Q502 AP EAMCET 2014 · 22 May · Offline MCQ

The number of solutions for $z^3 + \bar{z} = 0$ is

(A) 5
(B) 1
(C) 2
(D) 3

Answer: (A) 5 · The council's preliminary key

Q503 AP EAMCET 2014 · 22 May · Offline MCQ

The least positive integer n for which $(1+i)^n = (1-i)^n$ holds is

(A) 8
(B) 2
(C) 4
(D) 6

Answer: (C) 4 · The council's preliminary key

Q504 AP EAMCET 2014 · 22 May · Offline MCQ

If $x = p+q$, $y = pw + qw^2$ and $z = pw^2 + qw$ where w is a complex cube root of unity then $xyz =$

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(A) p^3+q^3
(B) p^2-pq+q^2
(C) $1+p^3+q^3$
(D) p^3-q^3

Answer: (A) p^3+q^3 · The council's preliminary key

Q505 AP EAMCET 2014 · 22 May · Offline MCQ

If $Z_r=\cos\left(\frac{\pi}{2^r}\right)+i\sin\left(\frac{\pi}{2^r}\right)$ for $r=1,2,3,\ldots\ldots\ldots$ then $Z_1Z_2Z_3\ldots\ldots\ldots\infty=$

(A) -2
(B) 1
(C) 2
(D) -1

Answer: (D) -1 · The council's preliminary key

Q506 AP EAMCET 2013 · 10 May · Offline MCQ

If α and β are the roots of the equation $x^2-2x+4=0$, then $\alpha^9+\beta^9=$

(A) -2^8
(B) 2^9
(C) -2^{10}
(D) 2^{10}

Answer: (C) -2^{10} · The council's preliminary key

Q507 AP EAMCET 2013 · 10 May · Offline MCQ

$\left(\frac{1+i}{1-i}\right)^4+\left(\frac{1-i}{1+i}\right)^4=$

(A) 0
(B) 1
(C) 2
(D) 4

Answer: (C) 2 · The council's preliminary key

Q508 AP EAMCET 2013 · 10 May · Offline MCQ

If a complex number z satisfies $|z^2-1|=|z|^2+1$, then z lies on :

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(A) the real axis
(B) the imaginary axis
(C) $y = x$
(D) a circle

Answer: (B) the imaginary axis · The council's preliminary key

Q509 AP EAMCET 2013 · 10 May · Offline MCQ

$\frac{(1+i)x-i}{2+i} + \frac{(1+2i)y+i}{2-i} = 1 \Rightarrow (x, y) =$

(A) $\left(\frac{7}{3}, \frac{-7}{15}\right)$
(B) $\left(\frac{7}{3}, \frac{7}{15}\right)$
(C) $\left(\frac{7}{5}, \frac{-7}{15}\right)$
(D) $\left(\frac{7}{5}, \frac{7}{15}\right)$

Answer: (A) $\left(\frac{7}{3}, \frac{-7}{15}\right)$ · The council's preliminary key

Q510 AP EAMCET 2012 · 12 May · Offline MCQ

If $a, b, c, d \in \mathbb{R}$ are such that $a^2 + b^2 = 4$ and $c^2 + d^2 = 2$ and if $(a + ib)^2 = (c + id)^2(x + iy)$ then $x^2 + y^2 =$

(A) 4
(B) 3
(C) 2
(D) 1

Answer: (A) 4 · Official APSCHE final key

Q511 AP EAMCET 2012 · 12 May · Offline MCQ

If z is a complex number such that $\left|z - \frac{4}{z}\right| = 2$, then the greatest value of $|z|$ is

(A) $1 + \sqrt{2}$
(B) $\sqrt{2}$
(C) $\sqrt{3} + 1$
(D) $1 + \sqrt{5}$

Answer: (D) $1 + \sqrt{5}$ · Official APSCHE final key

Q512 AP EAMCET 2012 · 12 May · Offline MCQ

If α is a non real root of the equation $x^6 - 1 = 0$ then $\frac{\alpha^2+\alpha^3+\alpha^4+\alpha^5}{\alpha+1} =$

(A) α
(B) 1
(C) 0
(D) -1

Answer: (D) -1 · Official APSCHE final key

Q513 AP EAMCET 2011 · 8 May · Offline MCQ

Let $z = a - \frac{i}{2}; a \in \mathbb{R}$. Then $|i + z|^2 - |i - z|^2 =$

(A) 2
(B) -2
(C) 4
(D) -4

Answer: (B) -2 · The council's preliminary key

Q514 AP EAMCET 2011 · 8 May · Offline MCQ

The locus of the complex number z such that $\arg\left(\frac{z-2}{z+2}\right) = \frac{\pi}{3}$ is :

(A) a circle
(B) a straight line
(C) a parabola
(D) an ellipse

Answer: (A) a circle · The council's preliminary key

Q515 AP EAMCET 2011 · 8 May · Offline MCQ

$\frac{(1+i)^{2011}}{(1-i)^{2009}} =$

(A) -1
(B) 1
(C) 2
(D) -2

Answer: (D) -2 · The council's preliminary key

Q516 AP EAMCET 2010 · 30 May · Offline MCQ

$z = 1 + i\sqrt{3} \Rightarrow |\text{Arg}\, z| + |\text{Arg}\, \bar{z}| =$

(A) 0
(B) $\frac{\pi}{3}$
(C) $\frac{\pi}{2}$
(D) $\frac{2\pi}{3}$

Answer: (D) $\frac{2\pi}{3}$ · Official APSCHE final key

Q517 AP EAMCET 2010 · 30 May · Offline MCQ

If ω is a complex cube root of unity, then $(x+1)(x+\omega)(x-\omega-1) =$

(A) $x^3 - 1$
(B) $x^3 + 1$
(C) $x^3 + 2$
(D) $x^3 - 2$

Answer: (B) $x^3 + 1$ · Official APSCHE final key

Q518 AP EAMCET 2010 · 30 May · Offline MCQ

$(\sqrt{3}+i)^7 + (\sqrt{3}-i)^7 =$

(A) $128\sqrt{3}$
(B) $256\sqrt{3}$
(C) $-128\sqrt{3}$
(D) $-256\sqrt{3}$

Answer: (C) $-128\sqrt{3}$ · Official APSCHE final key

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