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MATHEMATICS · EAPCET (EAMCET)

Quadratic Equations

Previous Year Questions with answers

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

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What is in this PDF: every Quadratic Equations 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.

Step-by-step solutions for every question are free in the EdLoop EAPCET app (Google Play) and on app.edloop.in. More chapters: pyq.edloop.in/free-pdfs/

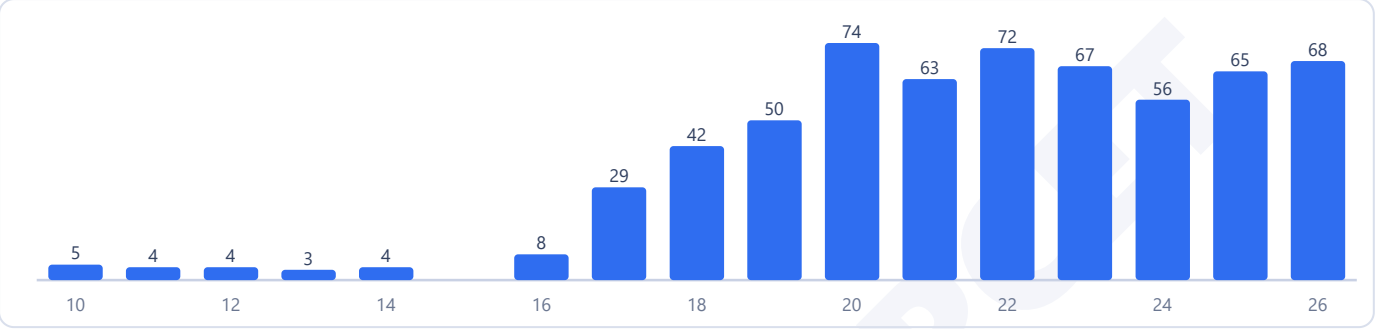
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Chapter at a glance

5.3%	614	77 of 77	614 / 0
of Mathematics questions, 2022–2026	questions, 2010–2026	papers asked it, 2022–2026	MCQ / numerical, 2010–2026

Trend. Steady: 4.1 questions per paper in 2024–2026 against 4.5 in 2022–2023.

Questions per year



Counts are the questions we hold: 614 in 149 papers. 20 questions in this chapter came back in more than one paper.

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

Higher Degree & Special Equations	179
Roots & Coefficients	163
Theory of Equations	152
Quadratic Expressions & Location of Roots	120

How often it comes up

Quadratic Equations stands as one of the heaviest algebraic pillars in the entire EAPCET test framework. Over the complete testing record from 2010 through 2026, Quadratic Equations generated 614 questions across 149 evaluated exam papers, featuring in all 149 papers to maintain an average of 4.1 questions per paper and a 5.2 percent subject share. Across the modern window from 2022 to 2026, the chapter sustained this comprehensive presence across all 77 sittings, producing 328 questions (yielding 4.3 questions per paper and a 5.3 percent subject share). This extraordinary volume positions Quadratic Equations at rank 7 among all 29 mathematics chapters.

Every paper in recent history includes between four and five questions from this chapter. In the three most recent testing cycles from 2024 to 2026, candidates faced 189 questions across 46 sittings (present in all 46 papers, averaging 4.1 questions per test with a 5.1 percent share). During the earlier period from 2010 to 2021, examiners set 286 questions across 72 sittings (appearing in all 72 papers, 4.0 per test, 5.0 percent share). Evaluating historical stability, 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 between 2022 and 2026, Andhra Pradesh sittings provided 194 questions across 48 papers (all 48 papers, 4.0 per test, 5.1 percent share), while Telangana sittings delivered 134 questions across 29 papers (all 29 papers, 4.6 per test, 5.8 percent share).

Most-asked topics

Questions distribute across four major algebraic domains:

- **Higher Degree & Special Equations**: Supplying 179 total questions, with 94 appearing in recent testing (last asked in 2026). Coverage includes biquadratic equations, symmetric reciprocal equations, radical equations, repeated roots, and high-order power sums via Newton sums.

- **Theory of Equations**: Accounting for 152 total questions, with 87 set in the modern era (tested up to 2026). Focus areas encompass Vieta relations connecting roots and coefficients for cubic and quartic polynomials, transformation of equations, diminishing or increasing roots by a constant h, and removing specific terms.
- **Roots & Coefficients**: Delivering 163 total questions, with 85 in recent examinations (last asked in 2026). Problems explore nature of roots via discriminant, condition for common roots, symmetric rational functions of roots, and constructing new quadratics from transformed roots.
- **Quadratic Expressions & Location of Roots**: Totaling 120 questions across all years, with 62 emerging recently (last tested in 2026). Key themes include sign of quadratic expressions, sign definiteness for all real x, maximum and minimum values, and location of roots relative to specified real constants.

What the questions look like

Examiners test both classical algebraic theory and intricate algebraic manipulation.

A staple question requires candidates to establish the range of a real parameter such that a given quadratic expression remains strictly positive for all real x, demanding a positive leading coefficient alongside a negative discriminant. Another very frequent format presents a cubic or quartic polynomial where roots form an arithmetic, geometric, or harmonic progression, requiring students to exploit Vieta formulas to solve for individual roots. Questions also frequently present symmetric equations reducible to quadratics through substitution, or ask students to diminish roots of a higher-degree polynomial by h to make a designated coefficient vanish.

How to practise it

Master Vieta relations for quadratic, cubic, and quartic polynomials. For a cubic with roots alpha, beta, and gamma, write down the sum of roots, the sum of pairwise products, and the product of roots. Practice expressing symmetric functions like the sum of root squares or cubes in terms of basic elementary symmetric polynomials.

Next, master root transformation techniques. To diminish the roots of polynomial f of x by h, apply synthetic division repeatedly by h to find the coefficients of f of x plus h. Learn Newton sums for calculating high powers of roots: for a quadratic a x squared plus b x plus c equals zero with roots alpha and beta, the power sum s sub n satisfies a times s sub n plus b times s sub n minus one plus c times s sub n minus two equals zero. Finally, memorize the conditions for root positioning: both roots greater than k, roots lying on either side of k, or both roots falling within an open interval.

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Q1 AP EAPCET 2026 · 18 May · Shift 1 MCQ

If the quadratic equations $x^2 + 2x - 4k = 0$ and $x^2 + 9x + 3k = 0$ have exactly one common root and $k \neq 0$, then the equation having k as a root is

(A) $x^2 + 5x - 6 = 0$
(B) $x^2 - 6x + 8 = 0$
(C) $x^2 - 5x - 6 = 0$
(D) $x^2 - 2x - 8 = 0$

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

Q2 AP EAPCET 2026 · 18 May · Shift 1 MCQ

The interval containing all the solutions of the inequation $\sqrt{x^2 - 12x + 48} < 2x + 3$ only is

(A) $(-\infty, -\sqrt{29} - 4) \cup (\sqrt{29} - 4, \infty)$
(B) $(-\infty, -\sqrt{29} - 4)$
(C) $(\sqrt{29} - 4, \infty)$
(D) $(-\sqrt{29} - 4, \sqrt{29} - 4)$

Answer: (C) $(\sqrt{29} - 4, \infty)$ · The council's preliminary key

Q3 AP EAPCET 2026 · 18 May · Shift 1 MCQ

If α, β, γ are the roots of the equation $24x^3 - 10x^2 - 3x + 1 = 0$, then $\frac{1}{\alpha^2} + \frac{1}{\beta^2} + \frac{1}{\gamma^2} =$

(A) 38
(B) 12
(C) 29
(D) 16

Answer: (C) 29 · The council's preliminary key

Q4 AP EAPCET 2026 · 18 May · Shift 1 MCQ

A positive root of the equation $18x^3 - 9x^2 - 5x + 2 = 0$ is twice another root of it. If among its 3 roots, the least value is a and the greatest value is b, then $2a + 3b =$

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

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

Q5 AP EAPCET 2026 · 18 May · Shift 2 MCQ

For a quadratic expression $ax^2 + bx + c$, if the minimum value $\frac{49}{12}$ exists at $x = \frac{-5}{6}$, then $12c - 5b =$

(A) 35
(B) 61
(C) 49
(D) 37

Answer: (C) 49 · The council's preliminary key

Q6 AP EAPCET 2026 · 18 May · Shift 2 MCQ

If $a, b, c \in R$ and $-a^2x^2 + bx + c > 0 \; \forall x \in \left(\frac{3-\sqrt{14}}{2}, \frac{3+\sqrt{14}}{2}\right)$, then $c^2 - \left(\frac{b}{4}\right)^2 =$

(A) $4a^2$
(B) a^3
(C) $4a$
(D) $2a^2$

Answer: (A) $4a^2$ · The council's preliminary key

Q7 AP EAPCET 2026 · 18 May · Shift 2 MCQ

The equation formed with the roots obtained by diminishing the roots of the equation $x^4 + 3x^3 - 7x^2 + 4x + 1 = 0$ by 'h', does not contain the x^2 term. If the possible values of such 'h' are $h_1 < 0$ and $h_2 > 0$, then which one of the following is true?

(A) $|h_1| < h_2$
(B) $|h_1| = |h_2|$
(C) $|h_1| > h_2$
(D) $\frac{h_1}{h_2} > -1$

Answer: (C) $|h_1| > h_2$ · The council's preliminary key

Q8 AP EAPCET 2026 · 18 May · Shift 2 MCQ

If $x^5 + ax^4 + bx^3 + cx^2 + 5x + e = 0$ is a reciprocal equation of second kind such that $a + b = 4$, then the number of complex roots of this equation is

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

Answer: (A) $3e - a$ · The council's preliminary key

Q9 AP EAPCET 2026 · 15 May · Shift 1 MCQ

Consider the quadratic expression $f(x) = x^2 + (10 - a)x - 10a$. The sum of all values of 'a', such that the roots of $f(x) = 3$ are integers is

(A) -40
(B) 120
(C) -80
(D) 125

Answer: (A) -40 · The council's preliminary key

Q10 AP EAPCET 2026 · 15 May · Shift 1 MCQ

The quadratic expression having zero's equal to the non-integral roots of $||3x-4|-6|=5$ is

(A) $x^2+\frac{2}{3}x-\frac{35}{9}$
(B) $x^2+\frac{4}{5}x+\frac{17}{25}$
(C) $x^2-\frac{5}{7}x+\frac{12}{49}$
(D) $x^2+\frac{1}{2}x+\frac{15}{4}$

Answer: (A) $x^2+\frac{2}{3}x-\frac{35}{9}$ · The council's preliminary key

Q11 AP EAPCET 2026 · 15 May · Shift 1 MCQ

If α,β,γ are the roots of the equation $x^3-3x+1=0$, then $\frac{\alpha}{1-\alpha}+\frac{\beta}{1-\beta}+\frac{\gamma}{1-\gamma}=$

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

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

Q12 AP EAPCET 2026 · 15 May · Shift 1 MCQ

If $x^5+ax^4+bx^3+cx^2+5x+d=0$ $(b\in R)$ is an odd order reciprocal equation of second type and $\frac{1+\sqrt{3}i}{2}$ is a root, then b – c =

(A) 0
(B) 5
(C) 12
(D) 18

Answer: (D) 18 · The council's preliminary key

Q13 AP EAPCET 2026 · 15 May · Shift 1 MCQ

Let the numerical values of the coefficients of a polynomial belong to the set $\{0,1,2,\ldots 9\}$. Then the number of reciprocal polynomials of third degree with the leading coefficient 1 that can be formed is

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(A) 36
(B) 30
(C) 38
(D) 50

Answer: (C) 38 · The council's preliminary key

Q14 AP EAPCET 2026 · 15 May · Shift 2 MCQ

Let α, β be the roots of the equation $x^2 + bx + c = 0$. If $\alpha + \beta < 0$, $|\alpha - \beta| = 8$ and $\alpha^2 + \beta^2 = 34$, then $b^4 + c^2 =$

(A) 241
(B) 94
(C) 265
(D) 162

Answer: (A) 241 · The council's preliminary key

Q15 AP EAPCET 2026 · 15 May · Shift 2 MCQ

The number of integers that satisfy both the inequalities $x^2 - 2x + 8 > 0$ and $x^2 - 3x + 2 \leq 0$ is

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

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

Q16 AP EAPCET 2026 · 15 May · Shift 2 MCQ

2 is a zero of the polynomial function $f(x) = x^4 + kx^3 + 22x^2 - 6x - 20$. If $-2, \alpha, \beta$ are the roots of the equation $x^3 + 3x^2 + 2kx - 40 = 0$ and $\alpha < \beta$, then $2\alpha + 3\beta =$

(A) 1
(B) 2
(C) 5
(D) 8

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

Q17 AP EAPCET 2026 · 15 May · Shift 2 MCQ

If '5' is the remainder when $2x^5 + kx^4 + 5x^3 - 3x^2 + 2x - 1$ is divided by $x^2 + x + 1$, then the quotient is

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(A) $2x^3 - x^2 + 10x + 4$
(B) $2x^3 - 5x^2 + 8x - 6$
(C) $2x^3 - 5x^2 + 10x + 4$
(D) $2x^3 - x^2 + 8x - 6$

Answer: (B) $2x^3 - 5x^2 + 8x - 6$ · The council's preliminary key

Q18 AP EAPCET 2026 · 14 May · Shift 1 MCQ

For the real values of x, the set of values of 'k' for which the function $f(x) = \frac{x^2 + x + 1}{x^2 + kx + 1}$ takes all real values is

(A) $(-2, 2)$
(B) $\{-1\}$
(C) $(-\infty, \infty)$
(D) $\emptyset$ (Null set)

Answer: (D) $\emptyset$ (Null set) · The council's preliminary key

Q19 AP EAPCET 2026 · 14 May · Shift 1 MCQ

If α, β $(\alpha < \beta)$ are the roots of $2x^2 - x - 6 = 0$ and $\alpha x^2 + kx - \beta \leq 0 \; \forall x \in \mathbb{R}$, then the number of integral values k takes is

(A) 24
(B) 15
(C) 6
(D) 7

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

Q20 AP EAPCET 2026 · 14 May · Shift 1 MCQ

If the equation $x^4 - 10x^3 + 37x^2 - 60x + 36 = 0$ has two distinct real roots, where each one of it is a repeated root, then sum of the squares of all the roots of the given equation is

(A) 74
(B) 26
(C) 52
(D) 68

Answer: (B) 26 · The council's preliminary key

Q21 AP EAPCET 2026 · 14 May · Shift 1 MCQ

If all the roots of the equation $x^5 - 3x^4 - 5x^3 + 27x^2 - 32x + 12 = 0$ are diminished by h to get a transformed equation in which the constant term is missing, then sum of the squares of all possible

values of h is

(A) 19
(B) 25
(C) 72
(D) 45

Answer: (A) 19 · The council's preliminary key

Q22 AP EAPCET 2026 · 14 May · Shift 1 MCQ

The quadratic equation whose roots are $\cos 72^\circ$ and $\sin 54^\circ$ is

(A) $4x^2 + \sqrt{5}x - 1 = 0$
(B) $4x^2 + 2\sqrt{5}x + 1 = 0$
(C) $4x^2 - 2\sqrt{5}x + 1 = 0$
(D) $x^2 - 2\sqrt{5}x + 4 = 0$

Answer: (C) $4x^2 - 2\sqrt{5}x + 1 = 0$ · The council's preliminary key

Q23 AP EAPCET 2026 · 14 May · Shift 1 MCQ

The cubic equation $2x^3 - 3x^2 + 6x + 2 = 0$

(A) has 3 distinct real roots
(B) has only one real root in the interval $(-1, 0)$
(C) has two distinct real roots
(D) has only one real root in the interval $(0, 1)$

Answer: (B) has only one real root in the interval $(-1, 0)$ · The council's preliminary key

Q24 AP EAPCET 2026 · 14 May · Shift 2 MCQ

If the minimum value of $f(x) = x^2 + 2bx + 2c^2$ is greater than the maximum value of $g(x) = -x^2 - 2cx + b^2$, x being real, then

(A) $|c| > \dfrac{|b|}{\sqrt{3}}$
(B) $-1 < c < \sqrt{2}b$
(C) $\dfrac{|c|}{\sqrt{2}} > |b|$
(D) No real values of b and c exist

Answer: (C) $\dfrac{|c|}{\sqrt{2}} > |b|$ · The council's preliminary key

Q25 AP EAPCET 2026 · 14 May · Shift 2 MCQ

If for all $x \in \mathbb{R}$, $\frac{1}{3} < \frac{x^2-2x+4}{x^2+2x+4} < 3$, then the values of $\frac{9\cdot 3^{2x}+6\cdot 3^x+4}{9\cdot 3^{2x}-6\cdot 3^x+4}$ lie between

(A) $\frac{1}{3}$ and 3
(B) $\frac{1}{2}$ and 2
(C) 0 and 2
(D) 3 and 9

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

Q26 AP EAPCET 2026 · 14 May · Shift 2 MCQ

If $\alpha, \beta, \gamma, \delta$ are the roots of the equation $x^4 + x^3 - x - 1 = 0$, then $\alpha^3 + \beta^3 + \gamma^3 + \delta^3 =$

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

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

Q27 AP EAPCET 2026 · 14 May · Shift 2 MCQ

If α is a root of the equation $x^4 - 4x^3 + 16x - 16 = 0$ of multiplicity m, then $m^2 - 4m + 2 =$

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

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

Q28 AP EAPCET 2026 · 13 May · Shift 1 MCQ

If α, β are the roots of $x^2 - p(x+1) - c = 0$, then $\frac{\alpha^2 + 2\alpha + 1}{\alpha^2 + 2\alpha + c} + \frac{\beta^2 + 2\beta + 1}{\beta^2 + 2\beta + c} =$

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

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

Q29 AP EAPCET 2026 · 13 May · Shift 1 MCQ

If $\alpha \neq \beta$ and $\alpha^2 = 5\alpha - 3$, $\beta^2 = 5\beta - 3$, then the equation whose roots are $\frac{\alpha}{\beta}$ and $\frac{\beta}{\alpha}$ is

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(A) $3x^2 + 19x + 3 = 0$
(B) $3x^2 + 19x - 3 = 0$
(C) $3x^2 - 19x + 3 = 0$
(D) $3x^2 - 19x - 3 = 0$

Answer: (C) $3x^2 - 19x + 3 = 0$ · The council's preliminary key

Q30 AP EAPCET 2026 · 13 May · Shift 1 MCQ

If the roots of the equation $x^3 - px^2 + qx - s = 0$ are in geometric progression, then

(A) $q^2 = ps^2$
(B) $q^2 = p^2 s$
(C) $q^3 = ps^3$
(D) $q^3 = p^3 s$

Answer: (D) $q^3 = p^3 s$ · The council's preliminary key

Q31 AP EAPCET 2026 · 13 May · Shift 1 MCQ

If α, β, γ are the roots of the equation $x^3 - 10x^2 + 7x + 8 = 0$, then match the items of List – I with those of List – II

List – I	List – II
A $\alpha + \beta + \gamma$	I $\frac{-43}{4}$
B $\alpha^2 + \beta^2 + \gamma^2$	II $\frac{-7}{8}$
C $\frac{1}{\alpha} + \frac{1}{\beta} + \frac{1}{\gamma}$	III 86
D $\frac{\alpha}{\beta\gamma} + \frac{\beta}{\alpha\gamma} + \frac{\gamma}{\alpha\beta}$	IV 30
	V 10

The correct match is

(A) A-V, B-III, C-I, D-II
(B) A-V, B-III, C-II, D-IV
(C) A-V, B-III, C-II, D-I
(D) A-V, B-II, C-III, D-I

Answer: (C) A-V, B-III, C-II, D-I · The council's preliminary key

Q32 AP EAPCET 2026 · 13 May · Shift 2 MCQ

If both the roots of a quadratic equation $x^2 + bx + c = 0$ are positive and b , c are non-zero real numbers, then $4bc$ is

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(A) greater than or equal to b^3
(B) greater than b^3
(C) less than or equal to b^3
(D) less than b^3

Answer: (A) greater than or equal to b^3 · The council's preliminary key

Q33 AP EAPCET 2026 · 13 May · Shift 2 MCQ

The interval that contains all the solutions of the inequation $\frac{2x-1}{x-3} > \frac{x+2}{3x+1}$ is

(A) $\left(-\frac{1}{3}, 3\right)$
(B) $\left(-\infty, -\frac{2}{3}\right) \cup \left(\frac{2}{3}, \infty\right)$
(C) $\left(-\frac{2}{3}, \frac{2}{3}\right)$
(D) $\left(-\infty, -\frac{1}{3}\right) \cup (3, \infty)$

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

Q34 AP EAPCET 2026 · 13 May · Shift 2 MCQ

Let 'α' be the remainder obtained by dividing the polynomial $x^5 - 2x^4 + 3x^3 - 4x^2 - x + 2$ with $(x - 2)$. If 'α' is a root of the equation $x^4 - 6x^3 - 35x^2 + 132x + 160 = 0$, then the sum of the cubes of the other three roots is

(A) 99
(B) -62
(C) -91
(D) 56

Answer: (B) -62 · The council's preliminary key

Q35 AP EAPCET 2026 · 13 May · Shift 2 MCQ

If the sum of two roots of the equation $12x^3 + 4x^2 - 3x - 1 = 0$ is zero, then the sum of the squares of the reciprocals of its roots is

(A) 26
(B) 14
(C) 17
(D) 38

Answer: (C) 17 · The council's preliminary key

Q36 AP EAPCET 2026 · 13 May · Shift 2 MCQ

If x is real, the maximum value of $\frac{3x^2 + 9x + 17}{3x^2 + 9x + 7}$ is

(A) $\frac{1}{4}$
(B) 1
(C) $\frac{17}{7}$
(D) 41

Answer: (D) 41 · The council's preliminary key

Q37 AP EAPCET 2026 · 12 May · Shift 1 MCQ

If α, β are the roots of $6x^2 - 6x + 1 = 0$, then

$$\frac{1}{2}(a + b\alpha + c\alpha^2 + d\alpha^3) + \frac{1}{2}(a + b\beta + c\beta^2 + d\beta^3) =$$

(A) $a + b + c + d$
(B) $a + 2b + 3c + 4d$
(C) $a + \frac{b}{2} + \frac{c}{3} + \frac{d}{4}$
(D) $a + b + \frac{c}{2} + \frac{d}{4}$

Answer: (C) $a + \frac{b}{2} + \frac{c}{3} + \frac{d}{4}$ · The council's preliminary key

Q38 AP EAPCET 2026 · 12 May · Shift 1 MCQ

If α, β are the roots of the equation $x^2 - 15x + 1 = 0$, then $\left(\frac{1}{\alpha} - 15\right)^{-2} + \left(\frac{1}{\beta} - 15\right)^{-2} =$

(A) 222
(B) 223
(C) 224
(D) 225

Answer: (B) 223 · The council's preliminary key

Q39 AP EAPCET 2026 · 12 May · Shift 1 MCQ

If α, β, γ are the roots of the equation $x^3 + 3x^2 - x - 3 = 0$, then $(1 + \alpha^2)(1 + \beta^2)(1 + \gamma^2) =$

(A) 38
(B) 39
(C) 40
(D) 41

Answer: (C) 40 · The council's preliminary key

Q40 AP EAPCET 2026 · 12 May · Shift 1 MCQ

If a and b are such that $x^2 - x - 1$ is a factor of $ax^3 + bx^2 + 1$, then $ab =$

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

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

Q41 AP EAPCET 2026 · 12 May · Shift 2 MCQ

The number of integral values of 'm' for which the quadratic expression $(1+2m)x^2-2(1+3m)x+4(1+m), x \in R$ is always positive, is

(A) 3
(B) 5
(C) 6
(D) 7

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

Q42 AP EAPCET 2026 · 12 May · Shift 2 MCQ

The values of x, which satisfy both the inequations $x^2-1 \leq 0$ and $x^2-x-2 \geq 0$, lie in the interval

(A) $(-1,2)$
(B) $(-1,1)$
(C) $[-1,2)$
(D) $\{-1\}$

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

Q43 AP EAPCET 2026 · 12 May · Shift 2 MCQ

If α, β, γ are roots of the equation $x^3+2x^2-x-2=0$, then $\alpha^6+\beta^6+\gamma^6=$

(A) 3
(B) 129
(C) 66
(D) 192

Answer: (C) 66 · The council's preliminary key

Q44 AP EAPCET 2026 · 12 May · Shift 2 MCQ

If α, β, γ are the roots of the equation $3x^3-26x^2+52x-24=0$ such that α, β, γ are in GP and $\alpha<\beta<\gamma$, then $3\alpha+2\beta+\gamma=$

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(A) $\frac{68}{3}$
(B) $\frac{56}{3}$
(C) 12
(D) 24

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

Q45 TS EAPCET 2026 · 11 May · Shift 1 MCQ

If the minimum value of the quadratic expression $ax^2 - 7x + 3a$ is $-\frac{1}{8}$, then the sum of the roots of the equation $ax^2 - 7x + 3a = 0$ is

(A) $\frac{7}{8}$
(B) 1
(C) $\frac{7}{2}$
(D) -14

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

Q46 TS EAPCET 2026 · 11 May · Shift 1 MCQ

If α, β are the roots of the equation $2x^2 - x - 3\lambda = 0$ $(\lambda \neq 0)$ and α, γ are the roots of the equation $2x^2 + 9x + 2\lambda = 0$, then the equation with roots $2\alpha + \beta$ and $\beta + \gamma$ is

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

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

Q47 TS EAPCET 2026 · 11 May · Shift 1 MCQ

If α, β, γ are the roots of the equation $x^3 - ax^2 - 4x + 4a = 0$, $\alpha + \beta = 0$ and $\beta + \gamma = 5$ then the sum of all possible values of a is

(A) 10
(B) 4
(C) -4
(D) -10

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

Q48 TS EAPCET 2026 · 11 May · Shift 1 MCQ

If $2x^5 + ax^4 - 12x^3 + bx^2 + x + c = 0$ is a reciprocal equation of class one, then the sum of all the rational roots of this equation is

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

Answer: (B) $-\frac{7}{2}$ · The council's preliminary key

Q49 TS EAPCET 2026 · 11 May · Shift 2 MCQ

If the equations $ax^2 + 2bx + 3c = 0$, $3x^2 + 8x + 15 = 0$ have a common root, where a, b, c are sides of triangle ABC, then $\cos 2A + \cos 2B + \cos 2C =$

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

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

Q50 TS EAPCET 2026 · 11 May · Shift 2 MCQ

A quadratic equation $x^2 - ax + b = 0, a > 0$ has real roots. If the sum of the roots is less than the product of the roots then b lies in the interval

(A) $(4, \infty)$
(B) $(-\infty, 0) \cup (4, \infty)$
(C) $(-\infty, 1) \cup (2, \infty)$
(D) $(1, 3)$

Answer: (A) $(4, \infty)$ · The council's preliminary key

Q51 TS EAPCET 2026 · 11 May · Shift 2 MCQ

If $\alpha, \beta, 5$ are the roots of the equation $x^3 - ax + a = \frac{\sin^2 x + \cos^4 x}{\cos^2 x + \sin^4 x}$, then $a(\alpha + \beta) =$

(A) -150
(B) -155
(C) 75
(D) 105

Answer: (B) -155 · The council's preliminary key

Q52 TS EAPCET 2026 · 11 May · Shift 2 MCQ

When each root of the equation $x^3 - ax^2 + bx + 1 = 0$ is diminished by h, if the transformed equation takes the form $9x^3 + \left(9 + \frac{a^3}{3}\right) = 0$, then $ah =$

(A) b
(B) 1
(C) $a^2 + b$
(D) $\frac{b^2}{3}$

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

Q53 TS EAPCET 2026 · 10 May · Shift 1 MCQ

If the sum of the squares of two consecutive positive odd integers is 1354, then one of them is

(A) a perfect square and the other is a perfect cube
(B) not a perfect square and the other is a perfect cube
(C) a perfect square and the other is not a perfect cube
(D) not a perfect square and the other is not a perfect cube

Answer: (A) a perfect square and the other is a perfect cube · The council's preliminary key

Q54 TS EAPCET 2026 · 10 May · Shift 1 MCQ

If $\alpha, \beta \in R$ and $\alpha \leq \frac{x^2 - 3x + 4}{x^2 - 4x + 5} \leq \beta \; \forall \; x \in R$ then $(2\alpha - 3)^2 + (2\beta - 3)^2 =$

(A) 10
(B) 8
(C) 6
(D) 4

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

Q55 TS EAPCET 2026 · 10 May · Shift 1 MCQ

If two roots of the equation $x^5 - 9x^4 + 27x^3 - 23x^2 - 24x + 36 = 0$ are repeated roots of multiplicity 2 and all the roots are integers then the sum of the squares of all different roots of the equation is

(A) 14
(B) 29
(C) 26
(D) 21

Answer: (A) 14 · The council's preliminary key

Q56 TS EAPCET 2026 · 10 May · Shift 1 MCQ

If $\alpha, \beta, \gamma, \delta$ are the roots of the equation $x^4 - 10x^3 + 35x^2 - 50x + 24 = 0$ and $\alpha^2, \beta^2, \gamma^2, \delta^2$ are the roots of the equation $x^4 + ax^3 + bx^2 + cx + d = 0$, then $a =$

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(A) 36
(B) 30
(C) -30
(D) -36

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

Q57 TS EAPCET 2026 · 10 May · Shift 2 MCQ

If $\alpha > 0$ and β are the roots of the equation $\sqrt{\frac{x-1}{x+2}} + \sqrt{\frac{x+2}{x-1}} = \frac{13}{6}$, then $4\alpha - \beta =$

(A) 9
(B) 18
(C) 24
(D) 27

Answer: (B) 18 · The council's preliminary key

Q58 TS EAPCET 2026 · 10 May · Shift 2 MCQ

The set of all values of x for which $\sqrt{x^2 - 5x + 7} > (x - 3)$ is

(A) $\mathbb{R}$
(B) ϕ (Empty set)
(C) $(2, \infty)$ only
(D) $(-\infty, 3)$ only

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

Q59 TS EAPCET 2026 · 10 May · Shift 2 MCQ

The number of real roots of the equation $e^{3x} - 2e^{2x} - e^x + 2 = 0$ is

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

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

Q60 TS EAPCET 2026 · 10 May · Shift 2 MCQ

If α and β are the integral roots of the equation $6x^4 + 5x^3 - 38x^2 + 5x + 6 = 0$, then $\alpha^4 + \beta^4 =$

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(A) 113
(B) 35
(C) 82
(D) 97

Answer: (D) 97 · The council's preliminary key

Q61 TS EAPCET 2026 · 9 May · Shift 1 MCQ

If $a \in z$ and the equation $(x-a)(x-10)+1=0$ has integral roots, then the values of a are

(A) 8, 12
(B) 12, 10
(C) 10, 8
(D) 9, 11

Answer: (A) 8, 12 · The council's preliminary key

Q62 TS EAPCET 2026 · 9 May · Shift 1 MCQ

If α, β are the rational roots and l, m are the irrational roots of $(x^2-9x+11)^2-(x-4)(x-5)=3$, then $\alpha+\beta+lm=$

(A) 2
(B) 16
(C) 8
(D) 12

Answer: (B) 16 · The council's preliminary key

Q63 TS EAPCET 2026 · 9 May · Shift 1 MCQ

Let $\alpha, \beta, \gamma, \delta$ be the roots of the equation $4x^4+8x^3-17x^2-12x+9=0$. If $4(\alpha+4)(\beta+4)(\gamma+4)(\delta+4)=k$, then $k=$

(A) 25
(B) 35
(C) 297
(D) 105

Answer: (C) 297 · The council's preliminary key

Q64 TS EAPCET 2026 · 9 May · Shift 1 MCQ

The number of real roots of the equation $x^7+3x^5-13x^3-15x=0$ is

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(A) 5
(B) 1
(C) 7
(D) 3

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

Q65 TS EAPCET 2026 · 9 May · Shift 2 MCQ

If $\alpha \in R$ and the equation $(x-\alpha)(x-3)+1=0$ has equal roots, then the sum of the squares of all the values of α is

(A) 13
(B) 25
(C) 26
(D) 20

Answer: (C) 26 · The council's preliminary key

Q66 TS EAPCET 2026 · 9 May · Shift 2 MCQ

The set of all values of x satisfying the inequation $\sqrt{x^2-2x+1} > x+2$ is

(A) $(-2, \infty)$
(B) $(-\infty, 0)$
(C) $\left(-\infty, -\frac{1}{2}\right)$
(D) $\left(-\frac{1}{2}, \infty\right)$

Answer: (C) $\left(-\infty, -\frac{1}{2}\right)$ · The council's preliminary key

Q67 TS EAPCET 2026 · 9 May · Shift 2 MCQ

Two real roots α, β of the equation $3x^4+ax^3+55x^2-52x+12=0$ are positive and equal. If the product of the other two real roots γ, δ of it is 1 and $\alpha, \beta, \gamma \in \mathrm{N}$, then $\alpha\beta - a + \frac{\gamma}{\delta} =$

(A) 25
(B) 52
(C) 28
(D) 35

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

Q68 TS EAPCET 2026 · 9 May · Shift 2 MCQ

If all the roots of the equation $x^5-3x^4+2x^3-3x^2+5x-2=0$ are increased by a real value h so that the term containing x^3 vanishes in the transformed equation and h is an integer, then h =

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

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

Q69 AP EAPCET 2025 · 27 May · Shift 1 MCQ

If α is the common root of the quadratic equations $x^2 - 5x + 4a = 0$, $x^2 - 2ax - 8 = 0$, where $a \in \mathbb{R}$, then the value of $\alpha^4 - \alpha^3 + 68$ is

(A) 260
(B) 250
(C) 0
(D) 240

Answer: (A) 260 · The council's preliminary key

Q70 AP EAPCET 2025 · 27 May · Shift 1 MCQ

If α, β are the roots of $x^2 - 5\gamma x - 6\delta = 0$ and γ, δ are the roots of $x^2 - 5\alpha x - 6\beta = 0$, then $\alpha + \beta + \gamma + \delta =$

(A) 0
(B) 125
(C) 144
(D) 180

Answer: (D) 180 · The council's preliminary key

Q71 AP EAPCET 2025 · 27 May · Shift 1 MCQ

The equation $x^{\frac{3}{4}(\log_2 x)^2 + \log_2 x - \frac{5}{4}} = \sqrt{2}$ has

(A) no real roots
(B) only one real solution
(C) exactly two real solutions
(D) exactly three real solutions

Answer: (D) exactly three real solutions · The council's preliminary key

Q72 AP EAPCET 2025 · 27 May · Shift 1 MCQ

If α, β, γ are the roots of the equation $x^3 + px^2 + qx + r = 0$, then $(\alpha + \beta)(\beta + \gamma)(\gamma + \alpha) =$

(A) $p - qr$
(B) $q - rp$
(C) $r - pq$
(D) $r + pq$

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

Q73 AP EAPCET 2025 · 26 May · Shift 1 MCQ

Let $f(x) = x^2 + 2bx + 2c^2$ and $g(x) = -x^2 - 2cx + b^2$, $x \in R$. If b and c are non-zero real numbers such that $\min f(x) > \max g(x)$, then $\left|\frac{c}{b}\right|$ lies in the interval

(A) $\left(\frac{1}{2}, \frac{1}{\sqrt{2}}\right)$
(B) $\left(\frac{1}{\sqrt{2}}, \sqrt{2}\right)$
(C) $(\sqrt{2}, \infty)$
(D) $(0, 1)$

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

Q74 AP EAPCET 2025 · 26 May · Shift 1 MCQ

If $x^2 - 4ax + 5 + a > 0$ for all $x \in R$ whenever $a \in (\alpha, \beta)$, then $4\beta + \alpha =$

(A) 0
(B) 4
(C) 5
(D) 8

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

Q75 AP EAPCET 2025 · 26 May · Shift 1 MCQ

If α, β, γ are the roots of the equation $x^3 - 12x^2 + kx - 18 = 0$ and one of them is thrice the sum of the other two roots, then $\alpha^2 + \beta^2 + \gamma^2 - k =$

(A) 115
(B) 41
(C) 56
(D) 57

Answer: (D) 57 · The council's preliminary key

Q76 AP EAPCET 2025 · 26 May · Shift 1 MCQ

The polynomial equation of degree 5 whose roots are the roots of the equation $x^5 - 3x^4 - x^3 + 11x^2 - 12x + 4 = 0$ each increased by 2, is

(A) $x^5 - 13x^4 + 63x^3 - 135x^2 - 108x = 0$
(B) $x^5 - 13x^4 + 63x^3 + 135x^2 + 108x = 0$
(C) $x^5 - 13x^4 + 63x^3 - 135x^2 + 108x = 0$
(D) $x^5 - 13x^4 - 63x^3 - 135x^2 - 108 = 0$

Answer: (C) $x^5 - 13x^4 + 63x^3 - 135x^2 + 108x = 0$ · The council's preliminary key

Q77 AP EAPCET 2025 · 26 May · Shift 2 MCQ

If the difference of the roots of the equation $x^2 - 7x + 10 = 0$ is same as the difference of the roots of the equation $x^2 - 17x + k = 0$, then a divisor of k is

(A) 14
(B) 17
(C) 6
(D) 15

Answer: (A) 14 · The council's preliminary key

Q78 AP EAPCET 2025 · 26 May · Shift 2 MCQ

The product of all the real roots of the equation $|x|^2 - 5|x| + 6 = 0$ is

(A) 25
(B) 36
(C) 4
(D) 16

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

Q79 AP EAPCET 2025 · 26 May · Shift 2 MCQ

If α, β and γ are the roots of the equation $5x^3 - 4x^2 + 3x - 2 = 0$, then $\alpha^3 + \beta^3 + \gamma^3 =$

(A) $\frac{17}{25}$
(B) $\frac{394}{125}$
(C) $\frac{34}{125}$
(D) $\frac{34}{25}$

Answer: (C) $\frac{34}{125}$ · The council's preliminary key

Q80 AP EAPCET 2025 · 26 May · Shift 2 MCQ

After the roots of the equation $6x^3 + 7x^2 - 4x - 2 = 0$ are diminished by h, if the transformed equation does not contain x term, then the product of all the possible values of h is

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(A) $1/3$
(B) $-2/3$
(C) $-2/9$
(D) $7/3$

Answer: (C) $-2/9$ · The council's preliminary key

Q81 AP EAPCET 2025 · 24 May · Shift 1 MCQ

The number of solutions of the equation $\sqrt{3x^2+x+5}=x-3$ is

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

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

Q82 AP EAPCET 2025 · 24 May · Shift 1 MCQ

The set of all real values of x for which $\frac{x^2-1}{(x-4)(x-3)} \geq 1$ is

(A) $[-1,1] \cup (3,4)$
(B) $\left[\frac{13}{7},3\right) \cup (4,\infty)$
(C) $\left(-\infty,\frac{13}{7}\right] \cup (3,4)$
(D) $\mathbb{R}-[3,4]$

Answer: (B) $\left[\frac{13}{7},3\right) \cup (4,\infty)$ · The council's preliminary key

Q83 AP EAPCET 2025 · 24 May · Shift 1 MCQ

If α, β and γ are the roots of the equation $2x^3+3x^2-5x-7=0$, then $\frac{1}{\alpha^2}+\frac{1}{\beta^2}+\frac{1}{\gamma^2}=$

(A) $-\frac{17}{49}$
(B) $-\frac{23}{49}$
(C) $\frac{55}{49}$
(D) $\frac{67}{49}$

Answer: (D) $\frac{67}{49}$ · The council's preliminary key

Q84 AP EAPCET 2025 · 24 May · Shift 1 MCQ

Two roots of the equation $ax^4+bx^3+cx^2+dx+e=0$ are positive and equal. If the product of the other two real roots is 1, then

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(A) $be^2 = a^2d$

(B) $3e + \frac{2b\sqrt{e}}{\sqrt{a}} + c = a$

(C) $e + 2b\sqrt{e} + 3c = a\sqrt{a}$

(D) $b^2e = ad^2$

Answer: (B) $3e + \frac{2b\sqrt{e}}{\sqrt{a}} + c = a$ · The council's preliminary key

Q85 AP EAPCET 2025 · 23 May · Shift 1 MCQ

If α, β are the roots of the equation $x^2 + bx + c = 0$ satisfying the conditions $\alpha + \beta = 5$ and $\alpha^3 + \beta^3 = 60$, then $3c + 2 =$

(A) $2b$

(B) $3b$

(C) $-3b$

(D) $-2b$

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

Q86 AP EAPCET 2025 · 23 May · Shift 1 MCQ

If $\frac{1}{2} \leq \frac{x^2+x+a}{x^2-x+a} \leq 2\ \forall x \in R$, then $a =$

(A) $\frac{3}{4}$

(B) $\frac{-3}{4}$

(C) $\frac{9}{4}$

(D) $\frac{-9}{4}$

Answer: (C) $\frac{9}{4}$ · The council's preliminary key

Q87 AP EAPCET 2025 · 23 May · Shift 1 MCQ

If α, β, γ are the roots of the equation $x^3 + ax^2 + bx + c = 0$, then $(\alpha + \beta - 2\gamma)(\beta + \gamma - 2\alpha)(\gamma + \alpha - 2\beta) =$

(A) $2a^3 + 9ab + 27c$

(B) $2a^3 + 9ab - 27c$

(C) $2a^3 - 9ab - 27c$

(D) $2a^3 - 9ab + 27c$

Answer: (D) $2a^3 - 9ab + 27c$ · The council's preliminary key

Q88 AP EAPCET 2025 · 23 May · Shift 1 MCQ

If the sum of two roots of the equation $x^4 + 2x^3 - 7x^2 - 8x + 12 = 0$ is zero, then the sum of the squares of the other two roots is

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(A) 5
(B) 10
(C) 13
(D) 25

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

Q89 AP EAPCET 2025 · 23 May · Shift 2 MCQ

Sum of the squares of the imaginary roots of the equation $z^8 - 20z^4 + 64 = 0$ is

(A) 0
(B) -12
(C) -4
(D) -16

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

Q90 AP EAPCET 2025 · 23 May · Shift 2 MCQ

Let $(a-3)x^2 + 12x + (a+6) > 0,\ \forall x \in R\ \&\ a \in (\ell, \infty)$. If α is the least positive integral value of a, then the roots of $(\alpha - 3)x^2 + 12x + (\ell + 2) = 0$ are

(A) $1, 2$
(B) $2, 3$
(C) $-1, -2$
(D) $-2, -3$

Answer: (C) $-1, -2$ · The council's preliminary key

Q91 AP EAPCET 2025 · 23 May · Shift 2 MCQ

If the roots of the equation $x^2 + 2ax + b = 0$ are real, distinct and differ atmost by 2m, then b lies in the interval

(A) $(a^2, a^2 + m^2]$
(B) $(a^2 + m^2, a^2)$
(C) $[a^2, a^2 + 2m^2]$
(D) $[a^2 - m^2, a^2)$

Answer: (D) $[a^2 - m^2, a^2)$ · The council's preliminary key

Q92 AP EAPCET 2025 · 23 May · Shift 2 MCQ

The cubic equation whose roots are the squares of the roots of the equation $x^3 - 2x^2 + 3x - 4 = 0$ is

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(A) $x^3 + 2x^2 + 7x - 16 = 0$
(B) $x^3 + 2x^2 - 7x - 16 = 0$
(C) $x^3 - 2x^2 - 7x + 16 = 0$
(D) $x^3 - 2x^2 + 7x + 16 = 0$

Answer: (B) $x^3 + 2x^2 - 7x - 16 = 0$ · The council's preliminary key

Q93 AP EAPCET 2025 · 23 May · Shift 2 MCQ

If α, β, γ are the roots of the equation $x^3 + px^2 + qx + r = 0$, then $\alpha^3 + \beta^3 + \gamma^3 =$

(A) $p^3 - 3pq + r$
(B) $p^2 - 2pq + r$
(C) $3pq - 3r - p^3$
(D) $3pq + 3r + p^3$

Answer: (C) $3pq - 3r - p^3$ · The council's preliminary key

Q94 AP EAPCET 2025 · 22 May · Shift 1 MCQ

If $(2k-1)x^2 - 2(3k-2)x + 4k > 0$ for every $x \in R$, then the sum of all possible integral values of k is

(A) 21
(B) 27
(C) 36
(D) 28

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

Q95 AP EAPCET 2025 · 22 May · Shift 1 MCQ

If α is a repeated root of multiplicity 2 of the equation $18x^3 - 33x^2 + 20x - 4 = 0$, then

(A) $3\alpha^2 - 8\alpha + 4 = 0$
(B) $3\alpha^2 + 8\alpha + 4 = 0$
(C) $3\alpha^2 - \alpha - 4 = 0$
(D) $3\alpha^2 + 2\alpha - 4 = 0$

Answer: (A) $3\alpha^2 - 8\alpha + 4 = 0$ · The council's preliminary key

Q96 AP EAPCET 2025 · 22 May · Shift 1 MCQ

The equation $6x^4 - 5x^3 + 13x^2 - 5x + 6 = 0$ will have

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(A) only real roots
(B) only complex roots
(C) two real and two complex roots
(D) two real and two purely imaginary roots

Answer: (B) only complex roots · The council's preliminary key

Q97 AP EAPCET 2025 · 22 May · Shift 2 MCQ

If $\alpha \neq 0$ and zero are the roots of the equation $x^2 - 5kx + \left(6k^2 - 2k\right) = 0$, then $\alpha =$

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

Answer: (C) $\frac{5}{3}$ · The council's preliminary key

Q98 AP EAPCET 2025 · 22 May · Shift 2 MCQ

The set of all real values of x satisfying the inequation $\frac{8x^2-14x-9}{3x^2-7x-6} > 2$ is

(A) $(-\infty, 1) \cup (3, \infty)$
(B) $\left(-\infty, -\frac{2}{3}\right) \cup (2, \infty)$
(C) $\left(-\frac{2}{3}, 2\right)$
(D) $\left(-\infty, -\frac{2}{3}\right) \cup (3, \infty)$

Answer: (D) $\left(-\infty, -\frac{2}{3}\right) \cup (3, \infty)$ · The council's preliminary key

Q99 AP EAPCET 2025 · 22 May · Shift 2 MCQ

When the roots of $x^3 + \alpha x^2 + \beta x + 6 = 0$ are increased by 1, if one of the resultant values is the least root of $x^4 - 6x^3 + 11x^2 - 6x = 0$, then

(A) $\alpha - \beta + 5 = 0$
(B) $\alpha + \beta + 7 = 0$
(C) $2\alpha + \beta + 7 = 0$
(D) $2\alpha + 3\beta - 1 = 0$

Answer: (A) $\alpha - \beta + 5 = 0$ · The council's preliminary key

Q100 AP EAPCET 2025 · 22 May · Shift 2 MCQ

Let 'a' be a non-zero real number. If the equation whose roots are the squares of the roots of the cubic equation $x^3 - ax^2 + ax - 1 = 0$ is identical with this cubic equation, then 'a' =

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

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

Q101 AP EAPCET 2025 · 21 May · Shift 1 MCQ

If the harmonic mean of the roots of the equation $\sqrt{2}x^2 - bx + (8 - 2\sqrt{5}) = 0$ is 4, then the value of b is

(A) 3
(B) 2
(C) $4 - \sqrt{5}$
(D) $4 + \sqrt{5}$

Answer: (C) $4 - \sqrt{5}$ · The council's preliminary key

Q102 AP EAPCET 2025 · 21 May · Shift 1 MCQ

All the values of k such that the quadratic expression $2kx^2 - (4k + 1)x + 2$ is negative for exactly three integral vaules of x, lie in the interval

(A) $\left[\frac{1}{12}, \frac{1}{10}\right)$
(B) $\left(\frac{1}{6}, \frac{1}{5}\right)$
(C) $[-1, 2)$
(D) $[2, 6)$

Answer: (A) $\left[\frac{1}{12}, \frac{1}{10}\right)$ · The council's preliminary key

Q103 AP EAPCET 2025 · 21 May · Shift 1 MCQ

If α and β ($\alpha > \beta$) are the multiple roots of the equation $4x^4 + 4x^3 - 23x^2 - 12x + 36 = 0$, then $2\alpha - \beta =$

(A) -1
(B) 3
(C) 5
(D) -7

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

Q104 AP EAPCET 2025 · 21 May · Shift 1 MCQ

If α, β and γ are the roots of the equation $x^3 - 13x^2 + kx + 189 = 0$ such that $\beta - \gamma = 2$, then $\beta + \gamma : k + \alpha =$

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(A) $4:3$
(B) $2:1$
(C) $6:5$
(D) $3:4$

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

Q105 AP EAPCET 2025 · 21 May · Shift 2 MCQ

The roots α, β of the equation $x^2 - 6(k-1)x + 4(k-2) = 0$ are equal in magnitude but opposite in sign. if $\alpha > \beta$, then the product of the roots of the equation $2x^2 - \alpha x + 6\beta(\alpha + 1) = 0$ is

(A) 12
(B) -12
(C) 16
(D) -18

Answer: (D) -18 · The council's preliminary key

Q106 AP EAPCET 2025 · 21 May · Shift 2 MCQ

If $ax^2 + bx + c < 0\ \forall x \in \mathbb{R}$ and the expressions $cx^2 + ax + b$ and $ax^2 + bx + c$ have their extreme values at the same point x, then for the expression $cx^2 + ax + b$

(A) Minimum value $= \frac{4b}{3}$
(B) Maximum value $= \frac{4a}{3}$
(C) Minimum value $= \frac{3a}{4}$
(D) Maximum value $= \frac{3b}{4}$

Answer: (D) Maximum value $= \frac{3b}{4}$ · The council's preliminary key

Q107 AP EAPCET 2025 · 21 May · Shift 2 MCQ

If $a \pm ib$ and $b \pm ai$ are the roots of $x^4 - 10x^3 + 50x^2 - 130x + 169 = 0$, then $\frac{a}{b} + \frac{b}{a} =$

(A) $\frac{25}{12}$
(B) $\frac{5}{2}$
(C) $\frac{13}{6}$
(D) $\frac{34}{15}$

Answer: (C) $\frac{13}{6}$ · The council's preliminary key

Q108 AP EAPCET 2025 · 21 May · Shift 2 MCQ

If $x^2 - 5x + 6$ is a factor of $f(x) = x^4 - 17x^3 + kx^2 - 247x + 210$, then the other quadratic factor of $f(x)$ is

(A) $x^2 + 12x + 35$
(B) $x^2 - 12x + 35$
(C) $x^2 - 6x + 35$
(D) $x^2 + 6x + 35$

Answer: (B) $x^2 - 12x + 35$ · The council's preliminary key

Q109 TS EAPCET 2025 · 4 May · Shift 1 MCQ

If $f(x) = x^2 + bx + c$ and $f(1 + k) = f(1 - k)\ \forall \mathrm{K} \in \mathbb{R}$, for two real numbers b and c, then

(A) $f(1) < f(0) < f(-1)$
(B) $f(-1) < f(0) < f(1)$
(C) $f(0) < f(-1) < f(1)$
(D) $f(0) < f(1) < f(-1)$

Answer: (A) $f(1) < f(0) < f(-1)$ · The council's preliminary key

Q110 TS EAPCET 2025 · 4 May · Shift 1 MCQ

If α, β are the roots of the equation $x^2 + 3x + k = 0$ and $\alpha + \frac{1}{\alpha}, \beta + \frac{1}{\beta}$ are the roots of the equation $4x^2 + px + 18 = 0$ then k satisfies the equation

(A) $2x^2 - 13x + 20 = 0$
(B) $x^2 - 5x + 6 = 0$
(C) $2x^2 - 7x + 3 = 0$
(D) $x^2 - 8x + 15 = 0$

Answer: (A) $2x^2 - 13x + 20 = 0$ · The council's preliminary key

Q111 TS EAPCET 2025 · 4 May · Shift 1 MCQ

If $f(x)$ is a second degree polynomial such that $f(x) \geq 0\ \forall x \in \mathbb{R}$, $f(-3) = 0$ and $f(0) = 18$ then $f(3) =$

(A) 36
(B) 72
(C) 144
(D) 288

Answer: (B) 72 · The council's preliminary key

Q112 TS EAPCET 2025 · 4 May · Shift 1 MCQ

If one of the roots of the equation $6x^3 - 25x^2 + 2x + 8 = 0$ is an integer and $\alpha > 0$, $\beta < 0$ are the other two roots, then $\frac{4}{\alpha} + \frac{1}{\beta} =$

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

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

Q113 TS EAPCET 2025 · 4 May · Shift 1 MCQ

If $\alpha, \beta, \gamma, \delta, \epsilon$ are the roots of the equation $x^5 + x^4 - 13x^3 - 13x^2 + 36x + 36 = 0$ and $\alpha < \beta < \gamma < \delta < \epsilon$ then $\frac{\epsilon}{\alpha} + \frac{\delta}{\beta} + \frac{1}{\gamma} =$

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

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

Q114 TS EAPCET 2025 · 4 May · Shift 2 MCQ

$f(x) = x^2 - 2(4K - 1)x + g(K) > 0\ \forall x \in \mathbb{R}$ and for $K \in (a, b)$. If $g(K) = 15K^2 - 2K - 7$, then

(A) $g(K)$ attains its maximum at the midpoint of (a, b)
(B) $g(K)$ attains its minimum at two points in (a, b)
(C) $g(K)$ attains its both maximum and minimum in (a, b)
(D) $g(K)$ attains no maximum and no minimum in (a, b)

Answer: (D) $g(K)$ attains no maximum and no minimum in (a, b) · The council's preliminary key

Q115 TS EAPCET 2025 · 4 May · Shift 2 MCQ

If $1 + 2i$ is a root of the equation $x^4 - 3x^3 + 8x^2 - 7x + 5 = 0$, then sum of the squares of the other roots is

(A) 0
(B) $2 + i$
(C) $-4 - 4i$
(D) $\frac{8}{3}$

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

Q116 TS EAPCET 2025 · 4 May · Shift 2 MCQ

If α, β, γ are the roots of the equation $x^3 + \frac{a}{2}x + b = 0$ and $(\alpha - \beta)(\alpha - \gamma)$, $(\beta - \alpha)(\beta - \gamma)$, $(\gamma - \alpha)(\gamma - \beta)$ are the roots of the equation $(y + a)^3 + \mathrm{K}(y + a)^2 + \mathrm{L} = 0$, then $\frac{\mathrm{L}}{\mathrm{K}} =$

(A) $\frac{32b^2}{a}$
(B) $\frac{16a^2}{b}$
(C) $\frac{18b^2}{a}$
(D) $\frac{12a^2}{b}$

Answer: (C) $\frac{18b^2}{a}$ · The council's preliminary key

Q117 TS EAPCET 2025 · 4 May · Shift 2 MCQ

If a, b are real numbers and α is a real root of $x^2 + 12 + 3\sin(a + bx) + 6x = 0$ then the value of $\cos(a + b\alpha)$ for the least positive value of $a + b\alpha$ is

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

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

Q118 TS EAPCET 2025 · 3 May · Shift 1 MCQ

If the equations $x^2 + px + 2 = 0$ and $x^2 + x + 2p = 0$ have a common root then the sum of the roots of the equation $x^2 + 2px + 8 = 0$ is

(A) -3
(B) 3
(C) 6
(D) -6

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

Q119 TS EAPCET 2025 · 3 May · Shift 1 MCQ

If both roots of the equation $x^2 - 5ax + 6a = 0$ exceed 1, then the range of 'a' is

(A) $[-1, 0) \cup \left[\frac{24}{25}, \infty\right)$
(B) $\left[\frac{24}{25}, \infty\right)$
(C) $[-1, 0)$
(D) $\mathbb{R}$

Answer: (B) $\left[\frac{24}{25}, \infty\right)$ · The council's preliminary key

Q120 TS EAPCET 2025 · 3 May · Shift 1 MCQ

If $\alpha, \beta, \gamma, \delta$ are the roots of the equation $x^4 - 4x^3 + 3x^2 + 2x - 2 = 0$ such that α and β are integers and γ, δ are irrational numbers, then $\alpha + 2\beta + \gamma^2 + \delta^2 =$

(A) 5
(B) 7
(C) 11
(D) 13

Answer: (C) 11 · The council's preliminary key

Q121 TS EAPCET 2025 · 3 May · Shift 1 MCQ

The equation having the multiple root of the equation $x^4 + 4x^3 - 16x - 16 = 0$ as its root is

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

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

Q122 TS EAPCET 2025 · 3 May · Shift 2 MCQ

If $\tan\theta$ and $\cot\theta$ are two distinct roots of the equation $ax^2 + bx + c = 0$, $a \neq 0$, $b \neq 0$, then

(A) $\cos 2\theta = -\dfrac{2b}{c}$
(B) $\sin 2\theta = -\dfrac{2c}{b}$
(C) $\tan 2\theta = \dfrac{2b}{c}$
(D) $\cot 2\theta = \dfrac{2c}{a}$

Answer: (B) $\sin 2\theta = -\dfrac{2c}{b}$ · The council's preliminary key

Q123 TS EAPCET 2025 · 3 May · Shift 2 MCQ

Sum of all the roots of the equation $||2x - 3| - 4| = 2$ is

(A) 8
(B) 0
(C) 6
(D) 9

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

Q124 TS EAPCET 2025 · 3 May · Shift 2 MCQ

If the quotient and remainder obtained when the expression $3x^5 - 6x^4 + 2x^3 + 4x^2 - 5x + 8$ is divided by the expression $x^2 - 2x + 3$ are $ax^3 + bx^2 + cx + d$ and $px + q$ respectively, then $ab + cd =$

(A) $p + 2q$

(B) $p + 2q - 2$

(C) $2p + q$

(D) $2p + q - 2$

Answer: (B) $p + 2q - 2$ · The council's preliminary key

Q125 TS EAPCET 2025 · 3 May · Shift 2 MCQ

If $\alpha, \beta, \gamma, \delta$ are the roots of the equation $12x^4 - 56x^3 + 89x^2 - 56x + 12 = 0$ such that $\alpha\beta = \gamma\delta = 1$ and $\frac{\alpha + \beta}{\gamma + \delta} > 1$, then $\frac{\alpha + \beta}{\gamma + \delta} =$

(A) $\frac{65}{6}$

(B) $\frac{13}{2}$

(C) $\frac{17}{15}$

(D) $\frac{15}{13}$

Answer: (D) $\frac{15}{13}$ · The council's preliminary key

Q126 TS EAPCET 2025 · 2 May · Shift 1 MCQ

α, β are the roots of the equation $\sin^2 x + b \sin x + c = 0$. If $\alpha + \beta = \frac{\pi}{2}$ then $b^2 - 1 =$

(A) c

(B) $2c$

(C) c^2

(D) $4c^2$

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

Q127 TS EAPCET 2025 · 2 May · Shift 1 MCQ

The number of integral values of 'a' for which the quadratic equation $ax^2 + ax + 5 = 0$ cannot have real roots is

(A) Infinite

(B) 20

(C) 19

(D) 5

Answer: (C) 19 · The council's preliminary key

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Q128 TS EAPCET 2025 · 2 May · Shift 1 MCQ

If the roots of the equation $32x^3 - 48x^2 + 22x - 3 = 0$ are in arithmetic progression, then the square of the common difference of the roots is

(A) $\frac{1}{4}$
(B) $\frac{1}{16}$
(C) $\frac{1}{9}$
(D) $\frac{1}{25}$

Answer: (B) $\frac{1}{16}$ · The council's preliminary key

Q129 TS EAPCET 2025 · 2 May · Shift 1 MCQ

If the sum of two roots of the equation $x^4 - 2x^3 + x^2 + 4x - 6 = 0$ is zero then the sum of the squares of the other two roots is

(A) -6
(B) 1
(C) -2
(D) 0

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

Q130 TS EAPCET 2025 · 2 May · Shift 2 MCQ

The value of the greatest positive integer k, such that $49^k + 1$ is a factor of $48(49^{125} + 49^{124} + ... + 49^2 + 49 + 1)$ is

(A) 32
(B) 63
(C) 65
(D) 60

Answer: (B) 63 · The council's preliminary key

Q131 TS EAPCET 2025 · 2 May · Shift 2 MCQ

If the equation $x^2 - 3ax + a^2 - 2a - K = 0$ has different real roots for every rational number a, then K lies in the interval

(A) $0 < K < \frac{4}{5}$
(B) $-\infty < K < \frac{4}{5}$
(C) $\frac{4}{5} < K < \infty$
(D) $-\infty < K < \infty$

Answer: (C) $\frac{4}{5} < K < \infty$ · The council's preliminary key

Q132 TS EAPCET 2025 · 2 May · Shift 2 MCQ

The number of all common roots of the equation $x^4 - 10x^3 + 37x^2 - 60x + 36 = 0$ and the transformed equation of it obtained by increasing any two distinct roots of it by 1, keeping the other two roots fixed, is

(A) 1
(B) 3
(C) 4
(D) 2

Options (2) or (4) were accepted. More than one answer was accepted. · The council's preliminary key

Q133 TS EAPCET 2025 · 2 May · Shift 2 MCQ

If α, β, γ are the roots of the equation $x^3 - \mathrm{P}x^2 + \mathrm{Q}x - \mathrm{R} = 0$ and $(\alpha - 2)^2$, $(\beta - 2)^2$, $(\gamma - 2)^2$ are the roots of the equation $x^3 - 5x^2 + 4x = 0$, then the possible least value of $\mathrm{P} + \mathrm{Q} + \mathrm{R}$ is

(A) 5
(B) -7
(C) -1
(D) 1

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

Q134 AP EAPCET 2024 · 23 May · Shift 1 MCQ

The set of all real values of x satisfying the inequality $\frac{7x^2-5x-18}{2x^2+x-6} < 2$ is

(A) $\left(-\infty, -\frac{2}{3}\right] \cup [3, \infty)$
(B) $\left(-2, -\frac{2}{3}\right) \cup \left(\frac{3}{2}, 3\right)$
(C) $(-\infty, -2) \cup \left(\frac{3}{2}, \infty\right)$
(D) $\left[-\frac{2}{3}, \frac{3}{2}\right)$

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

Q135 AP EAPCET 2024 · 23 May · Shift 1 MCQ

The set of all values of k for which the inequality $x^2 - (3k+1)x + 4k^2 + 3k - 3 > 0$ is true for all real values of x, is

(A) $\left(-\frac{13}{7}, 1\right)$
(B) $\left(-1, \frac{13}{7}\right)$
(C) $\left(-\infty, -\frac{13}{7}\right) \cup (1, \infty)$
(D) $(-\infty, -1) \cup \left(\frac{13}{7}, \infty\right)$

Answer: (C) $\left(-\infty, -\frac{13}{7}\right) \cup (1, \infty)$ · The council's preliminary key

Q136 AP EAPCET 2024 · 23 May · Shift 1 MCQ

The cubic equation whose roots are the squares of the roots of the equation $12x^3 - 20x^2 + x + 3 = 0$ is

(A) $x^3 + 376x^2 - 121x - 9 = 0$
(B) $144x^3 - 400x^2 + 121x + 98 = 0$
(C) $144x^3 - 376x^2 + 121x - 9 = 0$
(D) $x^3 + 400x^2 - 121x - 98 = 0$

Answer: (C) $144x^3 - 376x^2 + 121x - 9 = 0$ · The council's preliminary key

Q137 AP EAPCET 2024 · 23 May · Shift 1 MCQ

α, β, γ are the roots of the equation $x^3 + 3x^2 - 10x - 24 = 0$. If $\alpha(\beta + \gamma)$, $\beta(\gamma + \alpha)$ and $\gamma(\alpha + \beta)$ are the roots of the equation $x^3 + px^2 + qx + r = 0$, then $q =$

(A) -44
(B) -28
(C) 44
(D) 28

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

Q138 AP EAPCET 2024 · 22 May · Shift 1 MCQ

If α, β are the roots of the equation $x^2 - 6x - 2 = 0$, $\alpha > \beta$ and $a_n = \alpha^n - \beta^n$, $n \geq 1$, then the value of $\frac{a_{10} - 2a_8}{2a_9}$ is equal to

(A) 6
(B) 4
(C) 3
(D) 2

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

Q139 AP EAPCET 2024 · 22 May · Shift 1 MCQ

If both the roots of the equation $x^2 - 6ax + 2 - 2a + 9a^2 = 0$ exceed 3, then

(A) $a < \frac{3}{2}$
(B) $a > \frac{3}{2}$
(C) $a < \frac{5}{2}$
(D) $a > \frac{11}{9}$

Answer: (D) $a > \frac{11}{9}$ · The council's preliminary key

Q140 AP EAPCET 2024 · 22 May · Shift 1 MCQ

If α and β are two distinct negative roots of $x^5 - 5x^3 + 5x^2 - 1 = 0$, then the equation of least degree with integer coefficients having $\sqrt{-\alpha}$ and $\sqrt{-\beta}$ as its roots is

(A) $x^2 - 3x + 1 = 0$
(B) $-x^4 + 5x^2 - 5x + 1 = 0$
(C) $-x^4 - 5x^2 + 5x + 1 = 0$
(D) $x^4 - 3x^2 + 1 = 0$

Answer: (D) $x^4 - 3x^2 + 1 = 0$ · The council's preliminary key

Q141 AP EAPCET 2024 · 22 May · Shift 1 MCQ

If the number of real roots of $x^9 - x^5 + x^4 - 1 = 0$ is n, the number of complex roots having argument on imaginary axis is m and the number of complex roots having argument in 2^{nd} quadrant is K, then $m.n.k =$

(A) 6
(B) 9
(C) 12
(D) 24

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

Q142 AP EAPCET 2024 · 22 May · Shift 2 MCQ

If 'a' is a rational number, then the roots of the equation $x^2 - 3ax + a^2 - 2a - 4 = 0$ are

(A) rational and equal numbers
(B) different real numbers
(C) different rational numbers only
(D) not real numbers

Answer: (B) different real numbers · The council's preliminary key

Q143 AP EAPCET 2024 · 22 May · Shift 2 MCQ

The set of all real values 'a' for which $-1 < \frac{2x^2+ax+2}{x^2+x+1} < 3$ holds for all real values of x is

(A) $(-7, 5)$
(B) $(5, \infty)$
(C) $(1, 5)$
(D) $(-\infty, 1)$

Answer: (C) $(1, 5)$ · The council's preliminary key

Q144 AP EAPCET 2024 · 22 May · Shift 2 MCQ

The quotient when $3x^5 - 4x^4 + 5x^3 - 3x^2 + 6x - 8$ is divided by $x^2 + x - 3$ is

(A) $3x^2 - 7x - 21$

(B) $3x^3 - 7x^2 + 21x - 45$

(C) $3x^4 - 7x^3 + 21x^2 - 45 + 114$

(D) $114x - 143$

Answer: (B) $3x^3 - 7x^2 + 21x - 45$ · The council's preliminary key

Q145 AP EAPCET 2024 · 22 May · Shift 2 MCQ

If $\alpha_1, \alpha_2, \alpha_3, \alpha_4, \alpha_5$ are the roots of $x^5 - 5x^4 + 9x^3 - 9x^2 + 5x - 1 = 0$ then $\frac{1}{\alpha_1^2} + \frac{1}{\alpha_2^2} + \frac{1}{\alpha_3^2} + \frac{1}{\alpha_4^2} + \frac{1}{\alpha_5^2} =$

(A) 15

(B) $\frac{1}{7}$

(C) 7

(D) 12

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

Q146 AP EAPCET 2024 · 21 May · Shift 1 MCQ

Roots of the equation $a(b-c)x^2 + b(c-a)x + c(a-b) = 0$ are

(A) $\frac{a(b-c)}{c(a-b)}, 1$

(B) $\frac{b(c-a)}{c(a-b)}, 1$

(C) $\frac{c(a-b)}{a(b-c)}, 1$

(D) $\frac{c(a-b)}{b(c-a)}, 1$

Answer: (C) $\frac{c(a-b)}{a(b-c)}, 1$ · The council's preliminary key

Q147 AP EAPCET 2024 · 21 May · Shift 1 MCQ

If $(3+i)$ is a root of $x^2 + ax + b = 0$ then $a =$

(A) 3

(B) -3

(C) 6

(D) -6

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

Q148 AP EAPCET 2024 · 21 May · Shift 1 MCQ

The algebraic equation of degree 4 whose roots are the translates of the roots of the equation $x^4 + 5x^3 + 6x^2 + 7x + 9 = 0$ by -1 is

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(A) $x^4 + x^3 - 3x^2 + 6x + 4 = 0$
(B) $x^4 + 9x^3 + 27x^2 + 38x + 28 = 0$
(C) $x^4 + 5x^3 + 6x^2 + 7x + 9 = 0$
(D) $x^4 - 5x^3 + 6x^2 - 7x + 9 = 0$

Answer: (B) $x^4 + 9x^3 + 27x^2 + 38x + 28 = 0$ · The council's preliminary key

Q149 AP EAPCET 2024 · 21 May · Shift 1 MCQ

If the roots of the equation $4x^3 - 12x^2 + 11x + m = 0$ are in arithmetic progression, then $m =$

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

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

Q150 AP EAPCET 2024 · 21 May · Shift 2 MCQ

If x is real and α, β are maximum and minimum values of $\frac{x^2 - x + 1}{x^2 + x + 1}$ respectively then $\alpha + \beta =$

(A) $\frac{10}{3}$
(B) $\frac{8}{3}$
(C) $\frac{4}{3}$
(D) $\frac{2}{3}$

Answer: (A) $\frac{10}{3}$ · The council's preliminary key

Q151 AP EAPCET 2024 · 21 May · Shift 2 MCQ

If α is a common root of $x^2 - 5x + \lambda = 0$ and $x^2 - 8x - 2\lambda = 0$ $(\lambda \neq 0)$ and β, γ are the other roots of them, then $\alpha + \beta + \gamma + \lambda =$

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

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

Q152 AP EAPCET 2024 · 21 May · Shift 2 MCQ

The equation $x^4 - x^3 - 6x^2 + 4x + 8 = 0$ has two equal roots. If α, β are the other two roots of this equation then $\alpha^2 + \beta^2 =$

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

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

Q153 AP EAPCET 2024 · 21 May · Shift 2 MCQ

The condition that the roots of $x^3 - bx^2 + cx - d = 0$ are in arithmetic progression is

(A) $9cb = 2b^3 + 27d$
(B) $9cb = 2d^3 + 27b$
(C) $9cd = 2d^3 + 27b$
(D) $9cd = 2b^3 + 27d$

Answer: (A) $9cb = 2b^3 + 27d$ · The council's preliminary key

Q154 AP EAPCET 2024 · 20 May · Shift 1 MCQ

If α and β are two double roots of $x^2 + 3(a+3)x - 9a = 0$ for different values of a ($\alpha > \beta$), then the minimum value of $x^2 + \alpha x - \beta = 0$ is

(A) $\frac{69}{4}$
(B) $-\frac{69}{4}$
(C) $-\frac{35}{4}$
(D) $\frac{35}{4}$

Answer: (B) $-\frac{69}{4}$ · The council's preliminary key

Q155 AP EAPCET 2024 · 20 May · Shift 1 MCQ

If $2x^2 + 3x - 2 = 0$ and $3x^2 + \alpha x - 2 = 0$ have one common root, then the sum of all possible values of α is

(A) -3.5
(B) 7.5
(C) -7.5
(D) -1.5

Answer: (B) 7.5 · The council's preliminary key

Q156 AP EAPCET 2024 · 20 May · Shift 1 MCQ

If the sum of two roots of $x^3 + px^2 + qx - 5 = 0$ is equal to its third root, then $p(p^2 - 4q) =$

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(A) -20
(B) 20
(C) 40
(D) -40

Answer: (C) 40 · The council's preliminary key

Q157 AP EAPCET 2024 · 20 May · Shift 1 MCQ

If $P(x) = x^5 + ax^4 + bx^3 + cx^2 + dx + e$ is a polynomial such that $P(0) = 1$, $P(1) = 2$, $P(2) = 5$, $P(3) = 10$ and $P(4) = 17$, then $P(5) =$

(A) 26
(B) 146
(C) 126
(D) 76

Answer: (B) 146 · The council's preliminary key

Q158 AP EAPCET 2024 · 20 May · Shift 2 MCQ

Let $[r]$ denote the largest integer not exceeding r and the roots of the equation $3x^2 + 6x + 5 + \alpha(x^2 + 2x + 2) = 0$ are complex numbers whenever $\alpha > L$ and $\alpha < M$. If $(L - M)$ is minimum, then greatest value of $[r]$ such that $Ly^2 + My + r < 0$ for all $y \in \mathbb{R}$ is

(A) L
(B) M
(C) $L + M$
(D) $M - L$

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

Q159 AP EAPCET 2024 · 20 May · Shift 2 MCQ

For any real value of x, if $\frac{11x^2+12x+6}{x^2+4x+2} \notin (a, b]$ then the value x for which $\frac{11x^2+12x+6}{x^2+4x+2} = b - a + 3$ is

(A) $\frac{3}{4}$
(B) $\frac{3}{2}$
(C) 2
(D) $-\frac{1}{2}$

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

Q160 AP EAPCET 2024 · 20 May · Shift 2 MCQ

If the roots of $\sqrt{\frac{1-y}{y}} + \sqrt{\frac{y}{1-y}} = \frac{5}{2}$ are α and β $(\beta > \alpha)$ and the equation $(\alpha + \beta)x^4 - 25\alpha\beta x^2 + (\gamma + \beta - \alpha) = 0$ has real roots, then a possible value of y is

(A) $\frac{1}{2}$
(B) 4
(C) 2π
(D) $\sqrt{e+13}$

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

Q161 AP EAPCET 2024 · 20 May · Shift 2 MCQ

If the roots of the equation $x^3+ax^2+bx+c=0$ are in arithmetic progression, then

(A) $a^3-3ab+c=0$
(B) $9ab=2a^3+27c$
(C) $a^2-2bc+c=0$
(D) $3ab-3c-a^3=0$

Answer: (B) $9ab=2a^3+27c$ · The council's preliminary key

Q162 AP EAPCET 2024 · 19 May · Shift 2 MCQ

$$4+\cfrac{1}{4+\cfrac{1}{4+\cfrac{1}{4+\cdots\infty}}}=$$

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

Answer: (B) $2+\sqrt{5}$ · The council's preliminary key

Q163 AP EAPCET 2024 · 19 May · Shift 2 MCQ

If $x^2+5ax+6=0$ and $x^2+3ax+2=0$ have a common root then that common root is

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

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

Q164 AP EAPCET 2024 · 19 May · Shift 2 MCQ

If α,β,γ are roots of the equation $x^3+ax^2+bx+c=0$ then $\alpha^{-1}+\beta^{-1}+\gamma^{-1}=$

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(A) $\frac{a}{c}$
(B) $-\frac{b}{c}$
(C) $\frac{c}{a}$
(D) $\frac{b}{a}$

Answer: (B) $-\frac{b}{c}$ · The council's preliminary key

Q165 AP EAPCET 2024 · 19 May · Shift 2 MCQ

If the roots of the equation $x^3 - 13x^2 + Kx - 27 = 0$ are in geometric progression then $K =$

(A) -30
(B) 30
(C) 39
(D) -39

Answer: (C) 39 · The council's preliminary key

Q166 AP EAPCET 2024 · 18 May · Shift 1 MCQ

If the roots of the quadratic equation $x^2 - 35x + c = 0$ are in the ratio 2:3 and $c = 6K$, then $K =$

(A) 49
(B) 14
(C) 21
(D) 7

Answer: (A) 49 · The council's preliminary key

Q167 AP EAPCET 2024 · 18 May · Shift 1 MCQ

For real values of x and a, if the expression $\frac{x+a}{2x^2-3x+1}$ assumes all real values, then

(A) $a < -1$ or $a > -\frac{1}{2}$
(B) $-1 < a < -\frac{1}{2}$
(C) $\frac{1}{2} < a < 1$
(D) $a < \frac{1}{2}$ or $a > 1$

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

Q168 AP EAPCET 2024 · 18 May · Shift 1 MCQ

If the sum of two roots α, β of the equation $x^4 - x^3 - 8x^2 + 2x + 12 = 0$ is zero and γ, δ $(\gamma > \delta)$ are its other roots, then $3\gamma + 2\delta =$

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(A) 0
(B) 1
(C) 3
(D) 5

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

Q169 AP EAPCET 2024 · 18 May · Shift 1 MCQ

$f(x+h)=0$ represents the transformed equation of the equation $f(x)=x^4+2x^3-19x^2-8x+60=0$. If this transformation removes the term containing x^3 from $f(x)=0$, then $h=$

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

Answer: (A) $-1/2$ · The council's preliminary key

Q170 TS EAPCET 2024 · 11 May · Shift 1 MCQ

α,β are the real roots of the equation $x^2+ax+b=0$. If $\alpha+\beta=\frac{1}{2}$ and $\alpha^3+\beta^3=\frac{37}{8}$, then $a-\frac{1}{b}=$

(A) $\frac{-1}{6}$
(B) $\frac{3}{2}$
(C) $\frac{-3}{2}$
(D) $\frac{1}{6}$

Answer: (A) $\frac{-1}{6}$ · The council's preliminary key

Q171 TS EAPCET 2024 · 11 May · Shift 1 MCQ

The solution set of the inequation $\sqrt{x^2+x-2}>(1-x)$ is

(A) $(-\infty,2)$
(B) $(-\infty,-2)$
(C) $(1,\infty)$
(D) $(0,\infty)$

Answer: (C) $(1,\infty)$ · The council's preliminary key

Q172 TS EAPCET 2024 · 11 May · Shift 1 MCQ

If α,β,γ are the roots of the equation $4x^3-3x^2+2x-1=0$, then $\alpha^3+\beta^3+\gamma^3=$

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(A) $\frac{2}{27}$
(B) $\frac{1}{8}$
(C) $\frac{3}{64}$
(D) $\frac{27}{128}$

Answer: (C) $\frac{3}{64}$ · The council's preliminary key

Q173 TS EAPCET 2024 · 11 May · Shift 1 MCQ

The equation $16x^4 + 16x^3 - 4x - 1 = 0$ has a multiple root. If $\alpha, \beta, \gamma, \delta$ are the roots of this equation, then $\frac{1}{\alpha^4} + \frac{1}{\beta^4} + \frac{1}{\gamma^4} + \frac{1}{\delta^4} =$

(A) $\frac{1}{64}$
(B) $\frac{1}{32}$
(C) 32
(D) 64

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

Q174 TS EAPCET 2024 · 10 May · Shift 1 MCQ

α, β are the real roots of the equation $12x^{1/3} - 25x^{1/6} + 12 = 0$. If $\alpha > \beta$, then $\sqrt[6]{\frac{\alpha}{\beta}} =$

(A) $\frac{3}{2}$
(B) $\frac{4}{3}$
(C) $\frac{9}{8}$
(D) $\frac{16}{9}$

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

Q175 TS EAPCET 2024 · 10 May · Shift 1 MCQ

If the expression $7 + 6x - 3x^2$ attains its extreme value β at $x = \alpha$, then the sum of the squares of the roots of the equation $x^2 + \alpha x - \beta = 0$ is

(A) 21
(B) -19
(C) 19
(D) -21

Answer: (A) 21 · The council's preliminary key

Q176 TS EAPCET 2024 · 10 May · Shift 1 MCQ

α, β, γ are the roots of the equation $x^3 + 3x^2 - 10x - 24 = 0$. If $\alpha > \beta > \gamma$ and $\alpha^3 + 3\beta^2 - 10\gamma - 24 = 11\mathrm{k}$, then $\mathrm{k} =$

(A) 1
(B) 11
(C) 5
(D) 55

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

Q177 TS EAPCET 2024 · 10 May · Shift 1 MCQ

α, β, γ are the roots of the equation $8x^3 - 42x^2 + 63x - 27 = 0$. If $\beta < \gamma < \alpha$ and β, γ, α are in geometric progression, then the extreme value of the expression $\gamma x^2 + 4\beta x + \alpha$ is

(A) $\frac{3}{4}$
(B) 3
(C) $\frac{3}{2}$
(D) $\frac{21}{4}$

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

Q178 TS EAPCET 2024 · 10 May · Shift 2 MCQ

The solution set of the inequation $3^x + 3^{1-x} - 4 < 0$ contained in $\mathbb{R}$ is

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

Answer: (D) $(0, 1)$ · The council's preliminary key

Q179 TS EAPCET 2024 · 10 May · Shift 2 MCQ

The common solution set of the inequations $x^2 - 4x \leq 12$ and $x^2 - 2x \geq 15$ taken together is

(A) $(5, 6)$
(B) $[5, 6]$
(C) $[-3, 5]$
(D) $(-\infty, -3] \cup [5, \infty)$

Answer: (B) $[5, 6]$ · The council's preliminary key

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Q180 TS EAPCET 2024 · 10 May · Shift 2 MCQ

The roots of the equation $x^3 - 3x^2 + 3x + 7 = 0$ are α, β, γ and w, w^2 are complex cube roots of unity. If the terms containing x^2 and x are missing in the transformed equation when each one of these roots is decreased by h, then $\frac{\alpha-h}{\beta-h} + \frac{\beta-h}{\gamma-h} + \frac{\gamma-h}{\alpha-h} =$

(A) $\frac{3}{w^2}$
(B) $3w$
(C) 0
(D) $3w^2$

Answer: (D) $3w^2$ · The council's preliminary key

Q181 TS EAPCET 2024 · 10 May · Shift 2 MCQ

With respect to the roots of the equation $3x^3 + bx^2 + bx + 3 = 0$, match the items of List-I with those of List-II

LIST-I	LIST-II
A All the roots are negative	I $(b-3)^2 = 36 + P^2$ for $P \in \mathbb{R}$
B Two roots are complex	II $-3 < b < 9$
C Two roots are positive	III $b \in (-\infty, -3) \cup (9, \infty)$
D All roots are real and distinct	IV $b = 9$
	V $b = -3$

(A) A-V, B-III, C-I, D-II
(B) A-IV, B-I, C-II, D-III
(C) A-V, B-II, C-III, D-I
(D) A-IV, B-II, C-V, D-III

Answer: (D) A-IV, B-II, C-V, D-III · The council's preliminary key

Q182 TS EAPCET 2024 · 9 May · Shift 1 MCQ

If the quadratic equation $3x^2 + (2k+1)x - 5k = 0$ has real and equal roots, then the value of k such that $-\frac{1}{2} < k < 0$ is

(A) $\frac{-16+\sqrt{255}}{2}$
(B) $\frac{-16-\sqrt{255}}{2}$
(C) $-\frac{2}{3}$
(D) $-\frac{3}{5}$

Answer: (A) $\frac{-16+\sqrt{255}}{2}$ · The council's preliminary key

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Q183 TS EAPCET 2024 · 9 May · Shift 1 MCQ

The equations $2x^2 + ax - 2 = 0$ and $x^2 + x + 2a = 0$ have exactly one common root. If $a \neq 0$, then one of the roots of the equation $ax^2 - 4x - 2a = 0$ is

(A) 2
(B) -2
(C) $\frac{-4+\sqrt{22}}{3}$
(D) $\frac{-2+\sqrt{22}}{3}$

Answer: (D) $\frac{-2+\sqrt{22}}{3}$ · The council's preliminary key

Q184 TS EAPCET 2024 · 9 May · Shift 1 MCQ

If α, β, γ are the roots of the equation $2x^3 - 3x^2 + 5x - 7 = 0$, then $\sum \alpha^2\beta^2 =$

(A) $-\frac{17}{4}$
(B) $\frac{17}{4}$
(C) $-\frac{13}{4}$
(D) $\frac{13}{4}$

Answer: (A) $-\frac{17}{4}$ · The council's preliminary key

Q185 TS EAPCET 2024 · 9 May · Shift 1 MCQ

The sum of two roots of the equation $x^4 - x^3 - 16x^2 + 4x + 48 = 0$ is zero. If $\alpha, \beta, \gamma, \delta$ are the roots of this equation, then $\alpha^4 + \beta^4 + \gamma^4 + \delta^4 =$

(A) 123
(B) 369
(C) 132
(D) 396

Answer: (B) 369 · The council's preliminary key

Q186 TS EAPCET 2024 · 9 May · Shift 2 MCQ

α is a root of the equation $\frac{x-1}{\sqrt{2x^2-5x+2}} = \frac{41}{60}$. If $-\frac{1}{2} < \alpha < 0$, then $\alpha =$

(A) $-\frac{5}{31}$
(B) $-\frac{7}{34}$
(C) $-\frac{9}{37}$
(D) $-\frac{11}{41}$

Answer: (B) $-\frac{7}{34}$ · The council's preliminary key

Q187 TS EAPCET 2024 · 9 May · Shift 2 MCQ

If $4+3x-7x^2$ attains its maximum value M at $x=\alpha$ and $5x^2-2x+1$ attains its minimum value m at $x=\beta$, then $\frac{28(\mathrm{M}-\alpha)}{5(\mathrm{m}+\beta)}=$

(A) 28
(B) 23
(C) 5
(D) 1

Answer: (B) 23 · The council's preliminary key

Q188 TS EAPCET 2024 · 9 May · Shift 2 MCQ

If α,β,γ are the roots of the equation $2x^3-5x^2+4x-3=0$, then $\sum\alpha\beta(\alpha+\beta)=$

(A) 8
(B) 4
(C) 2
(D) $\frac{1}{2}$

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

Q189 TS EAPCET 2024 · 9 May · Shift 2 MCQ

$\alpha,\beta,\gamma,2,\varepsilon$ are the roots of the equation $x^5+4x^4-13x^3-52x^2+36x+144=0$. If $\alpha<\beta<\gamma<2<\varepsilon$, then $\alpha+2\beta+3\gamma+5\varepsilon=$

(A) -1
(B) 25
(C) -36
(D) 48

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

Q190 AP EAPCET 2023 · 19 May · Shift 1 MCQ

If the roots of the equation $6x^3-11x^2+6x-1=0$ are in harmonic progression, then the roots of $x^3-6x^2+11x-6=0$ will be in

(A) Geometric Progression
(B) Arithmetic Progression
(C) Harmonic Progression
(D) Arithmetico – Geometric Progression

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

Q191 AP EAPCET 2023 · 19 May · Shift 1 MCQ

The number of elements in the set $S = \{x \in \mathbb{Z} : x^2 - 7x + 6 \leq 0 \text{ and } x^2 - 3x > 0\}$ is

(A) ∞
(B) 2
(C) 3
(D) 4

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

Q192 AP EAPCET 2023 · 19 May · Shift 1 MCQ

If $3 + i$ and $2 - \sqrt{3}$ are the roots of the equation $f(x) = a_0 + a_1x + a_2x^2 + \ldots + a_nx^n$; $a_0, a_1, \ldots, a_n \in \mathbb{Z}$, then the least value of n and the value of a_0 are respectively

(A) $4, 1$
(B) $4, 10$
(C) $4, -10$
(D) $4, -1$

Answer: (B) $4, 10$ · The council's preliminary key

Q193 AP EAPCET 2023 · 19 May · Shift 1 MCQ

If α, β and γ are the roots of the equation $x^3 + 3x^2 + 4x + 5 = 0$, then the cubic equation whose roots are $1 + 4\alpha$, $1 + 4\beta$ and $1 + 4\gamma$ is

(A) $x^3 + 9x^2 - 21x + 267 = 0$
(B) $x^3 + 9x^2 + 43x - 267 = 0$
(C) $x^3 + 9x^2 + 41x + 267 = 0$
(D) $x^3 + 9x^2 + 43x + 267 = 0$

Answer: (D) $x^3 + 9x^2 + 43x + 267 = 0$ · The council's preliminary key

Q194 AP EAPCET 2023 · 19 May · Shift 1 MCQ

If $\frac{k}{kx+3} + \frac{3}{3x-k} = \frac{12x+5}{(kx+3)(3x-k)}$ $\forall x \in R - \left\{\frac{-3}{k}, \frac{k}{3}\right\}$, then both the roots of the equation $kx^2 - 7x + 3 = 0$ are

(A) Rational numbers
(B) Irrational numbers
(C) Complex numbers
(D) Integers

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

Q195 AP EAPCET 2023 · 19 May · Shift 1 MCQ

The maximum value of 'a' such that the second derivative of $x^4 + ax^3 + \frac{3x^2}{2} + 1$ is positive for all real x is

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

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

Q196 AP EAPCET 2023 · 18 May · Shift 1 MCQ

If α, β and γ are the roots of the equation $x^3 + ax^2 + bx + c = 0$, then the roots of the equation $x^3 + (2b - a^2)x^2 + (b^2 - 2ac)x - c^2 = 0$ are

(A) $\alpha^3, \beta^3, \gamma^3$
(B) $(\alpha + 1)^2, (\beta + 1)^2, (\gamma + 1)^2$
(C) $\alpha^2, \beta^2, \gamma^2$
(D) $(\alpha - 1)^2, (\beta - 1)^2, (\gamma - 1)^2$

Answer: (C) $\alpha^2, \beta^2, \gamma^2$ · The council's preliminary key

Q197 AP EAPCET 2023 · 18 May · Shift 1 MCQ

The value of $4x^3 - 4x^2 - 7x + 127$ when $x = \frac{4 + 5\sqrt{-1}}{2}$ is

(A) 1
(B) 2
(C) 3
(D) 4

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

Q198 AP EAPCET 2023 · 18 May · Shift 1 MCQ

If one root of the equation $x^3 - 6x^2 + 3x + 10 = 0$ is the average of the other two, then the sum of fourth powers of the roots of the equation is

(A) 642
(B) 643
(C) 644
(D) 645

Answer: (A) 642 · The council's preliminary key

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Q199 AP EAPCET 2023 · 18 May · Shift 1 MCQ

If the equation having the roots as the values obtained by diminishing each root of the equation $x^3 - 3x^2 + 2x - 1 = 0$ by K is $x^3 - x - 1 = 0$, then K =

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

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

Q200 AP EAPCET 2023 · 18 May · Shift 2 MCQ

If the roots of the equation $3x^2 + 4kx + 3 = 0$ are non-real, then k lies in the interval

(A) $\left[-2, \frac{-3}{2}\right]$
(B) $\left[\frac{3}{2}, 2\right]$
(C) $\left(\frac{-3}{2}, \frac{3}{2}\right)$
(D) $(2, 3)$

Answer: (C) $\left(\frac{-3}{2}, \frac{3}{2}\right)$ · The council's preliminary key

Q201 AP EAPCET 2023 · 18 May · Shift 2 MCQ

If $\operatorname{cosec}\theta$ and $\cot\theta$ are the roots of $cx^2 + bx + a = 0$ $(bc \neq 0)$, then $b^2(b^2 - 4ac) =$

(A) $-2c^4$
(B) $2c^4$
(C) $-c^4$
(D) c^4

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

Q202 AP EAPCET 2023 · 18 May · Shift 2 MCQ

The sum of the fourth powers of the roots of the equation $16x^2 - 10x + 1 = 0$ is

(A) $\frac{257}{4096}$
(B) $\frac{257}{2048}$
(C) $\frac{257}{1024}$
(D) $\frac{257}{512}$

Answer: (A) $\frac{257}{4096}$ · The council's preliminary key

Q203 AP EAPCET 2023 · 18 May · Shift 2 MCQ

If $P(x) = 0$ is a polynomial equation of least degree with integer coefficients and $\sqrt{2} + \sqrt{3}i$ is one of its roots, then that equation is

(A) $x^6 - 2x^4 + 2x^2 - 25 = 0$
(B) $x^5 + 3x^4 + 2x^2 + 24 = 0$
(C) $x^4 + 2x^2 + 25 = 0$
(D) $x^4 - 2x^2 + 25 = 0$

Answer: (C) $x^4 + 2x^2 + 25 = 0$ · The council's preliminary key

Q204 AP EAPCET 2023 · 17 May · Shift 1 MCQ

The set $\{x \in \mathbb{R} : 4 + 11x - 3x^2 > 0\}$ is the interval

(A) $\left(-\frac{1}{3}, 4\right)$
(B) $\left(\frac{1}{3}, 4\right)$
(C) $\left(-4, \frac{1}{3}\right)$
(D) $\left(-4, \frac{-1}{3}\right)$

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

Q205 AP EAPCET 2023 · 17 May · Shift 1 MCQ

If the sum of the cubes of the roots of the equation $x^3 - ax^2 + bx - c = 0$ is zero, then $a^3 + 3c =$

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

Answer: (D) $3ab$ · The council's preliminary key

Q206 AP EAPCET 2023 · 17 May · Shift 1 MCQ

If α, β, γ are the roots of $x^3 + 2x + 5 = 0$, then $\sum \frac{\beta+\gamma}{\alpha^2} =$

(A) $-\frac{2}{5}$
(B) $\frac{1}{5}$
(C) $\frac{2}{5}$
(D) $-\frac{3}{5}$

Answer: (C) $\frac{2}{5}$ · The council's preliminary key

Q207 AP EAPCET 2023 · 17 May · Shift 2 MCQ

For $x \in \mathbb{R}$, the minimum value of $\frac{x^2 + 2x + 5}{x^2 + 4x + 10}$ is

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(A) $\frac{1}{2}$
(B) $\frac{4}{3}$
(C) $\frac{3}{4}$
(D) $-\frac{1}{2}$

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

Q208 AP EAPCET 2023 · 17 May · Shift 2 MCQ

If α and β are the roots of the equation $2^{6x} - 3\left(2^{3x+2}\right) + 32 = 0$ with $\beta < 1$, then $2\alpha + 3\beta =$

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

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

Q209 AP EAPCET 2023 · 17 May · Shift 2 MCQ

If α, β and γ are the roots of the equation $x^3 - ax^2 + bx - c = 0$ then, $\alpha^{-2} + \beta^{-2} + \gamma^{-2} =$

(A) $\frac{b^2 - 3ac}{c^2}$
(B) $\frac{b^2 - ac}{c^2}$
(C) $\frac{b^2 - 2ac}{c^2}$
(D) $\frac{b^2 - 4ac}{c^2}$

Answer: (C) $\frac{b^2 - 2ac}{c^2}$ · The council's preliminary key

Q210 AP EAPCET 2023 · 17 May · Shift 2 MCQ

If α_1, α_2 and α_3 are the roots of $x^3 + 3x + 2 = 0$, then $\alpha_1^5 + \alpha_2^5 + \alpha_3^5 =$

(A) -30
(B) 6
(C) -6
(D) 30

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

Q211 AP EAPCET 2023 · 16 May · Shift 1 MCQ

If $z_1 = 2 - 3i$ and the roots of the equation $z^3 + bz^2 + cz + d = 0$ are i, z_1 and $\overline{z_1}$, then $b + c + d =$

(A) 13
(B) 7
(C) $9-10i$
(D) $10-10i$

Answer: (C) $9-10i$ · The council's preliminary key

Q212 AP EAPCET 2023 · 16 May · Shift 1 MCQ

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

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

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

Q213 AP EAPCET 2023 · 16 May · Shift 1 MCQ

If α and β are the roots of the equation $ax^2+bx+c=0$, then the equation whose roots are $\alpha+\beta$ and $\frac{1}{\alpha}+\frac{1}{\beta}$ is

(A) $acx^2-(ab+bc)x+b^2=0$
(B) $acx^2+(ab+bc)x-b^2=0$
(C) $acx^2+(ab+bc)x+b^2=0$
(D) $acx^2-(ab+bc)x-b^2=0$

Answer: (C) $acx^2+(ab+bc)x+b^2=0$ · The council's preliminary key

Q214 AP EAPCET 2023 · 16 May · Shift 1 MCQ

If the roots of the equation $16x^3-44x^2+36x-9=0$ are in harmonic progression, then its greatest root is

(A) $\frac{3}{4}$
(B) $\frac{3}{2}$
(C) $\frac{1}{2}$
(D) $-\frac{1}{2}$

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

Q215 AP EAPCET 2023 · 16 May · Shift 2 MCQ

If a and b are the roots of the equation $y^2+y+1=0$, then the value of $a^4+b^4+a^{-1}b^{-1}$ is

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(A) 1
(B) 0
(C) 5
(D) 2

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

Q216 AP EAPCET 2023 · 16 May · Shift 2 MCQ

If $x^2 + x - 6$ is a factor of $2x^3 + x^2 + ax + b$, then $6a + 13b =$

(A) 305
(B) 133
(C) 0
(D) -1

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

Q217 AP EAPCET 2023 · 16 May · Shift 2 MCQ

If c and d are the roots of $x^2 + ax + b = 0$, then a root of $x^2 + (4c + a)x + \left(b + 2ac + 4c^2\right) = 0$ is

(A) $d + 2c$
(B) $d + c$
(C) $d - c$
(D) $d - 2c$

Answer: (D) $d - 2c$ · The council's preliminary key

Q218 AP EAPCET 2023 · 16 May · Shift 2 MCQ

If the equation $x^4 + 7x^3 + 18x^2 + 20x + 8 = 0$ has a repeated root, then that repeated root is

(A) -2
(B) -1
(C) -3
(D) -4

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

Q219 AP EAPCET 2023 · 16 May · Shift 2 MCQ

If the equation $2x^3 + 5x^2 - 4x - 12 = 0$ has a repeated root, then the constant term of the quadratic equation whose roots are the distinct roots of the given equation is

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(A) -6
(B) -5
(C) -4
(D) -2

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

Q220 AP EAPCET 2023 · 15 May · Shift 1 MCQ

If the values of k for which the equation $x^2+2(k+2)x+6k+7=0$ has equal roots are k_1 and k_2, then $k_1^2+k_2^2=$

(A) 8
(B) 9
(C) 10
(D) 12

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

Q221 AP EAPCET 2023 · 15 May · Shift 1 MCQ

If $\left(3+2\sqrt{2}\right)^{x^2-4}+\left(3-2\sqrt{2}\right)^{x^2-4}=6$, then $x^4+x^2+5=$

(A) -30
(B) -35
(C) 30
(D) 35

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

Q222 AP EAPCET 2023 · 15 May · Shift 1 MCQ

If the equation $x^4+ax^3+bx^2+cx+d=0$ has three equal roots, then that root is

(A) $\frac{6c-ab}{8b-3a^2}$
(B) $\frac{ab-6c}{8b+3a^2}$
(C) $\frac{6c-ab}{3a^2-4b}$
(D) $\frac{6c-ab}{3a^2-8b}$

Answer: (D) $\frac{6c-ab}{3a^2-8b}$ · The council's preliminary key

Q223 AP EAPCET 2023 · 15 May · Shift 1 MCQ

If -1 is a twice repeated root of the equation $a\left(x^3+x^2\right)+bx+c=0$, then $a:b:c=$

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(A) $1 : -1 : 1$

(B) $-1 : 1 : 1$

(C) $1 : 1 : -1$

(D) $1 : 1 : 1$

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

Q224 AP EAPCET 2023 · 15 May · Shift 2 MCQ

If one root of the equation $ax^3 + bx + c = 0$ is twice another root, then

(A) $36b^3 = 343ac^2$

(B) $36b^3 + 343ac^2 = 0$

(C) $36b^3 + 729ac^2 = 0$

(D) $36b^3 = 729ac^2$

Answer: (B) $36b^3 + 343ac^2 = 0$ · The council's preliminary key

Q225 AP EAPCET 2023 · 15 May · Shift 2 MCQ

α and β are the roots of the equation $x^2 - ax + b = 0$. If $\alpha^2 + \beta^2$ and $\alpha^3 + \beta^3$ are the roots of the equation $Ax^2 + Bx + C = 0$, then $C =$

(A) $a^5 - 5a^3b + 6ab^2$

(B) $a^5 + 5a^3b - 6ab^2$

(C) $a^5 - 5a^3b - 6ab^2$

(D) $a^5 + 5a^3b + 6ab^2$

Answer: (A) $a^5 - 5a^3b + 6ab^2$ · The council's preliminary key

Q226 AP EAPCET 2023 · 15 May · Shift 2 MCQ

If -1 is a twice repeated root of the equation $ax^3 + bx^2 + cx + 1 = 0$, then

(A) $b = 2a + 1,\ c = a + 1$

(B) $b = 2a + 1,\ c = a - 2$

(C) $b = 2a + 1,\ c = a + 2$

(D) $b = 2a - 1,\ c = a + 2$

Answer: (C) $b = 2a + 1,\ c = a + 2$ · The council's preliminary key

Q227 AP EAPCET 2023 · 15 May · Shift 2 MCQ

The minimum value of $f(x) = \dfrac{x^2 - 2x + 3}{x^2 - 4x + 7}$ is

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

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

Q228 TS EAMCET 2023 · 14 May · Shift 1 MCQ

If $x^2+2px-2p+8>0$ for all real values of x, then the set of all possible values of p is

(A) $(2,4)$
(B) $(-\infty,-4)$
(C) $(2,\infty)$
(D) $(-4,2)$

Answer: (D) $(-4,2)$ · The council's preliminary key

Q229 TS EAMCET 2023 · 14 May · Shift 1 MCQ

The quadratic equation whose roots are $\sin^2 18^\circ$ and $\cos^2 36^\circ$ is

(A) $16x^2-12x-1=0$
(B) $16x^2-12x+4=0$
(C) $16x^2-12x+1=0$
(D) $16x^2+12x+1=0$

Answer: (C) $16x^2-12x+1=0$ · The council's preliminary key

Q230 TS EAMCET 2023 · 14 May · Shift 1 MCQ

The roots of the equation $x^4+x^3-4x^2+x+1=0$ are diminished by h so that the transformed equation does not contain x^2 term. If the values of such h are α and β, then $12(\alpha-\beta)^2=$

(A) 35
(B) 25
(C) 105
(D) 115

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

Q231 TS EAMCET 2023 · 14 May · Shift 1 MCQ

α,β,γ are the roots of the equation $x^3+2x^2-x-2=0$ then $\alpha^6+\beta^6+\gamma^6=$

(A) 3
(B) 129
(C) 66
(D) 192

Answer: (C) 66 · The council's preliminary key

Q232 TS EAMCET 2023 · 14 May · Shift 1 MCQ

If $\sin 2\theta$ and $\cos 2\theta$ are solutions of $x^2 + ax - c = 0$, then

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

Answer: (B) $a^2 + 2c - 1 = 0$ · The council's preliminary key

Q233 TS EAMCET 2023 · 14 May · Shift 2 MCQ

If α, β are the roots of $x^2 + ax + 2 = 0$ and $\frac{1}{\alpha}, \frac{1}{\beta}$ are the roots of $x^2 - bx + c = 0$, then

$$\left(\alpha + \frac{1}{\beta}\right)\left(\beta + \frac{1}{\alpha}\right)\left(\alpha - \frac{1}{\alpha}\right)\left(\beta - \frac{1}{\beta}\right) =$$

(A) $\frac{9}{4}(9 - a^2)$
(B) $\frac{9}{4}(9 + a^2)$
(C) $\frac{9}{4}(9 - b^2)$
(D) $\frac{9}{4}(9 + b^2)$

Answer: (A) $\frac{9}{4}(9 - a^2)$ · The council's preliminary key

Q234 TS EAMCET 2023 · 14 May · Shift 2 MCQ

The sum of all the real values of x satisfying the equation $\left(x^2 - 7x + 11\right)^{x^2 - 6x - 7} = 1$ is

(A) 14
(B) 20
(C) 13
(D) 16

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

Q235 TS EAMCET 2023 · 14 May · Shift 2 MCQ

If a polynomial $P(x)$ given by $P(x) = 2x^4 + ax^3 + bx^2 + cx + d$ is such that $P(1) = 4$, $P(2) = 7$, $P(3) = 12$ and $P(4) = 19$, then $P(5) =$

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(A) 28
(B) 76
(C) 26
(D) 72

Answer: (B) 76 · The council's preliminary key

Q236 TS EAMCET 2023 · 14 May · Shift 2 MCQ

If the roots of the equation $kx^3 - 18x^2 - 36x + 8 = 0$ are in harmonic progression, then $k =$

(A) 64
(B) 45
(C) 81
(D) 27

Answer: (C) 81 · The council's preliminary key

Q237 TS EAMCET 2023 · 14 May · Shift 2 MCQ

If α, β, γ are the roots of the equation $x^3 + x^2 + x + 1 = 0$ then match the items of List I with those of List II

List I	List II
(i) $\frac{1}{\alpha} + \frac{1}{\beta} + \frac{1}{\gamma}$	a) -1
(ii) $\alpha^3 + \beta^3 + \gamma^3$	b) -4
(iii) $\alpha^4 + \beta^4 + \gamma^4$	c) 1
(iv) $(\alpha - \beta)^2 + (\beta - \gamma)^2 + (\gamma - \alpha)^2$	d) 3
	e) 0

Then the correct match is

(A) (i) → a, (ii) → a, (iii) → d, (iv) → b
(B) (i) → c, (ii) → a, (iii) → e, (iv) → b
(C) (i) → a, (ii) → c, (iii) → d, (iv) → b
(D) (i) → c, (ii) → a, (iii) → b, (iv) → e

Answer: (A) (i) → a, (ii) → a, (iii) → d, (iv) → b · The council's preliminary key

Q238 TS EAMCET 2023 · 13 May · Shift 1 MCQ

If $x^2 + 3x - 2k = 0$ and $x^2 - 2x - 7k = 0$ have a non-zero common root, then the positive root of the equation $kx^2 + (k+2)x - (k+1) = 0$ is

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

Answer: (D) $\frac{3}{5}$ · The council's preliminary key

Q239 TS EAMCET 2023 · 13 May · Shift 1 MCQ

The values of $\frac{x^2-2x+1}{x^2+x-1}$ do not lie in the interval

(A) $\left(-\frac{4}{5}, 0\right)$
(B) $\left(-\infty, -\frac{4}{5}\right)$
(C) $(0, \infty)$
(D) $\left(\frac{4}{5}, \infty\right)$

Answer: (A) $\left(-\frac{4}{5}, 0\right)$ · The council's preliminary key

Q240 TS EAMCET 2023 · 13 May · Shift 1 MCQ

If α, β, γ are the roots of the equation $x^3 - 3x^2 + 3x + 1 = 0$, then $\alpha^2\beta^2 + \beta^2\gamma^2 + \gamma^2\alpha^2 =$

(A) 9
(B) 15
(C) 8
(D) 20

Answer: (B) 15 · The council's preliminary key

Q241 TS EAMCET 2023 · 13 May · Shift 1 MCQ

If α, β, γ are the roots of the equation $x^3 + 4x^2 - 9x - 36 = 0$ and $\alpha < \beta < \gamma$ then $\alpha + 2\beta + 3\gamma =$

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

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

Q242 TS EAMCET 2023 · 13 May · Shift 1 MCQ

If the sum of two particular roots of the equation $x^4 - 4x^3 - 7x^2 + 22x + 24 = 0$ is equal to the sum of the remaining two roots, then the sum of the cubes of all the roots of this equation is

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(A) 100
(B) 196
(C) 0
(D) 82

Answer: (D) 82 · The council's preliminary key

Q243 TS EAMCET 2023 · 13 May · Shift 2 MCQ

Let the equations $ax^2 - 7x + c = 0$ and $ax^2 + 5x - c = 0$ have a common root and $ac \neq 0$. If 3 is a root of $ax^2 - 7x + c = 0$ other than the common root, then the common root of the given equations is

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

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

Q244 TS EAMCET 2023 · 13 May · Shift 2 MCQ

The set of all values of x for which the inequalities $x^2 - 7x + 10 \geq 0$ and $2x + 3 - x^2 > 0$ hold simultaneously is

(A) $(-\infty, 2]$
(B) $(3, \infty)$
(C) $(-1, 2]$
(D) $[2, 3)$

Answer: (C) $(-1, 2]$ · The council's preliminary key

Q245 TS EAMCET 2023 · 13 May · Shift 2 MCQ

If α, β, γ are the roots of the equation $2x^3 + x^2 - 13x + 6 = 0$, then $\alpha^3 + \beta^3 + \gamma^3 =$

(A) $-\frac{161}{8}$
(B) 36
(C) 99
(D) $-\frac{151}{8}$

Answer: (D) $-\frac{151}{8}$ · The council's preliminary key

Q246 TS EAMCET 2023 · 13 May · Shift 2 MCQ

If α, β, γ are the real roots of the equation $18x^3 - 15x^2 - 4x + 4 = 0$ such that $\alpha = \beta$ and $\alpha > \gamma$, then $\alpha + \beta^2 + \gamma^3 =$

(A) $\frac{71}{72}$
(B) $\frac{53}{54}$
(C) $\frac{89}{90}$
(D) $\frac{59}{60}$

Answer: (A) $\frac{71}{72}$ · The council's preliminary key

Q247 TS EAMCET 2023 · 13 May · Shift 2 MCQ

If α is a multiple root of the equation $x^5 - 6x^4 + 11x^3 - 2x^2 - 12x + 8 = 0$ then $3\alpha^2 - 2\alpha + 1 =$

(A) -2
(B) 1
(C) 0
(D) 9

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

Q248 TS EAMCET 2023 · 12 May · Shift 1 MCQ

If one root of the equation $4x^2 - 2x + k - 4 = 0$ is the reciprocal of the other, then the value of k is

(A) -8
(B) 8
(C) -4
(D) 4

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

Q249 TS EAMCET 2023 · 12 May · Shift 1 MCQ

If the expression $x^3 + 3x^2 - 9x + \lambda$ is of the form $(x - \alpha)^2(x - \beta)$, then the values of λ are

(A) $27, -5$
(B) $-27, -5$
(C) $27, 5$
(D) $-27, 5$

Answer: (D) $-27, 5$ · The council's preliminary key

Q250 TS EAMCET 2023 · 12 May · Shift 1 MCQ

If $(x - 2)$ is a common factor of the expressions $x^2 + ax + b$ and $x^2 + cx + d$, then $\frac{b-d}{c-a} =$

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(A) 1
(B) 2
(C) 3
(D) 4

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

Q251 TS EAMCET 2023 · 12 May · Shift 1 MCQ

The roots of the equation $x^3 - 14x^2 + 56x - 64 = 0$ are in

(A) arithmetic-geometric progression
(B) harmonic progression
(C) arithmetic progression
(D) geometric progression

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

Q252 TS EAMCET 2023 · 12 May · Shift 1 MCQ

The sum of the roots of the equation $e^{4t} - 10e^{3t} + 29e^{2t} - 20e^{t} + 4 = 0$ is

(A) $\log_e 10$
(B) $2\log_e 2$
(C) $\log_e 2$
(D) $2\log_e 10$

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

Q253 TS EAMCET 2023 · 12 May · Shift 2 MCQ

The set of all values of x which satisfy both the inequations $x^2 - 1 \leq 0$ and $x^2 - x - 2 \geq 0$ simultaneously is

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

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

Q254 TS EAMCET 2023 · 12 May · Shift 2 MCQ

For all real values of x, the minimum value of $\dfrac{1 - x + x^2}{1 + x + x^2}$ is

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(A) 0
(B) $\frac{1}{3}$
(C) 1
(D) 3

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

Q255 TS EAMCET 2023 · 12 May · Shift 2 MCQ

The quadratic equations $x^2 - 6x + a = 0$ and $x^2 - cx + 6 = 0$ have one root in common. If the other roots of the first and second equations are integers and are in the ratio $4 : 3$, then their common root is

(A) 4
(B) 3
(C) 2
(D) 1

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

Q256 TS EAMCET 2023 · 12 May · Shift 2 MCQ

If the equation whose roots are p times the roots of the equation $x^4 - 2ax^3 + 4bx^2 + 8ax + 16 = 0$ is a reciprocal equation, then $|p| =$

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

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

Q257 TS EAMCET 2022 · 20 Jul · Shift 1 MCQ

If α, β are the roots of a quadratic equation $x^2 + bx + c = 0$ such that $\alpha^2 + \beta^2 = 5$ and $\alpha^3 + \beta^3 = 9$, then $b + c =$

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

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

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Q258 TS EAMCET 2022 · 20 Jul · Shift 1 MCQ

The set of all real values of the expression $\frac{x^2-x+2}{x^2+x-2}$ for all $x \in \mathbb{R}-\{-2,1\}$ is

(A) $(-2,3)$
(B) $\left[\frac{7}{9},\infty\right)$
(C) $(-\infty,-1]\cup\left[\frac{7}{9},\infty\right)$
(D) $(-\infty,-1]$

Answer: (C) $(-\infty,-1]\cup\left[\frac{7}{9},\infty\right)$ · The council's preliminary key

Q259 TS EAMCET 2022 · 20 Jul · Shift 1 MCQ

If α,β,γ are the roots of the equation $x^3-9x^2+23x-15=0$, then $\alpha^3+\beta^3+\gamma^3=$

(A) 36
(B) 92
(C) 153
(D) 244

Answer: (C) 153 · The council's preliminary key

Q260 TS EAMCET 2022 · 20 Jul · Shift 1 MCQ

If $\alpha,\beta,2\beta$ are the real roots of the equation $x^3-9x^2+k=0$ and $k\in\mathbb{R}-\{0\}$, then $14\beta=$

(A) 28
(B) 36
(C) 18
(D) 54

Answer: (D) 54 · The council's preliminary key

Q261 TS EAMCET 2022 · 20 Jul · Shift 1 MCQ

The sum of all distinct roots of the equation $x^5-3x^4+5x^3-5x^2+3x-1=0$ is

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

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

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Q262 TS EAMCET 2022 · 20 Jul · Shift 1 MCQ

$(x^4+1)=\frac{1}{a}(x+1)^4$ is a reciprocal equation

(A) only for $a=1$
(B) for all $a\in\mathbb{R}-\{1\}$
(C) for all $a\in\mathbb{R}$
(D) when a is an irrational number

Answer: (B) for all $a\in\mathbb{R}-\{1\}$ · The council's preliminary key

Q263 TS EAMCET 2022 · 20 Jul · Shift 2 MCQ

Statement (I) : The set of solutions of $|x|^2-4|x|+3<0$ is the interval $(-3,3)$.
Statement (II) : If $x<3$ or $x>5$ then $x^2-8x+15>0$.
Which of the above statements is(are) true?

(A) Statement I is true, but Statement II is false
(B) Statement II is true but Statement I is false
(C) Both Statement I and Statement II are true
(D) Both Statement I and Statement II are false

Answer: (B) Statement II is true but Statement I is false · The council's preliminary key

Q264 TS EAMCET 2022 · 20 Jul · Shift 2 MCQ

If $6x-x^2+12$ attains its extreme value β at $x=\alpha$ then $\beta=$

(A) 7α
(B) 5α
(C) 3α
(D) α

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

Q265 TS EAMCET 2022 · 20 Jul · Shift 2 MCQ

Let α be a common root of the equations $x^3-2x-25\lambda=0,\ 3x^3-8x-\frac{175}{3}\lambda=0$ and $\lambda>0$. Then $\lambda=$

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

Answer: (C) $\frac{3}{5\sqrt{5}}$ · The council's preliminary key

Q266 TS EAMCET 2022 · 20 Jul · Shift 2 MCQ

If the sum of two roots of the equation $x^3 - 7px^2 + 5qx - 6r = 0$ is zero, then

(A) $5p = \frac{6q}{7r}$
(B) $5q = \frac{6r}{7p}$
(C) $5r = \frac{6p}{7q}$
(D) $pqr = 35$

Answer: (B) $5q = \frac{6r}{7p}$ · The council's preliminary key

Q267 TS EAMCET 2022 · 20 Jul · Shift 2 MCQ

If α, β are the irrational roots of the equation $3p^2x^3 + px^2 + qx + 3 = 0$ when $p = 1$ and $q = -7$ then $|\alpha - \beta| =$

(A) $\frac{3\sqrt{13}}{2}$
(B) $\frac{\sqrt{3}}{2}$
(C) $\frac{2\sqrt{13}}{3}$
(D) 4

Answer: (C) $\frac{2\sqrt{13}}{3}$ · The council's preliminary key

Q268 TS EAMCET 2022 · 20 Jul · Shift 2 MCQ

The roots of a cubic equation $f(x) = 0$ are diminished by $\frac{3}{2}$ so as to remove the term containing x^2 and the transformed equation is $8x^3 - 54x - 78 = 0$. Then the equation $f(x) = 0$ is

(A) $2x^3 - 9x^2 - 6 = 0$
(B) $2x^3 - 9x^2 - 27x - 6 = 0$
(C) $8x^3 + 3x^2 - 6 = 0$
(D) $8x^3 - 9x^2 + 12x - 15 = 0$

Answer: (A) $2x^3 - 9x^2 - 6 = 0$ · The council's preliminary key

Q269 TS EAMCET 2022 · 19 Jul · Shift 1 MCQ

If α, β are the roots of the equation $x^2 - 2\sqrt{3}\,x + 4 = 0$ then $\alpha^6 + \beta^6 =$

(A) 128
(B) -64
(C) 64
(D) -128

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

Q270 TS EAMCET 2022 · 19 Jul · Shift 1 MCQ

When $b = 17$, it is found that the roots of the equation $x^2 + bx + c = 0$ are -2 and -15. If α, β are the roots of the same equation when $b = 13$ then $|\alpha - \beta| =$

(A) 7
(B) 13
(C) 17
(D) 30

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

Q271 TS EAMCET 2022 · 19 Jul · Shift 1 MCQ

Let x be a real number.

Match the following:

List - I
A) The maximum value of $2x^2 + 4x + 5$
B) The maximum value of $\dfrac{x^2 + 4x + 1}{x^2 + x + 1}$
C) If $1 \le \dfrac{3x^2 - 5x + 6}{x^2 + 1} \le 2, \forall x \in [a, b]$ then $b =$
D) If $1 \le \dfrac{3x^2 - 5x + 6}{x^2 + 1} \le 2, \forall x \in [a, b]$ then $a =$

List - II
I) -1
II) 1
III) 2

IV) 3
V) 4

The correct match is:

(A) A-IV, B-III, C-II, D-V
(B) A-IV, B-V, C-II, D-III
(C) A-IV, B-III, C-V, D-II
(D) A-III, B-V, C-IV, D-I

Answer: (C) A-IV, B-III, C-V, D-II · The council's preliminary key

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Q272 TS EAMCET 2022 · 19 Jul · Shift 1 MCQ

If α, β, γ are the roots of the equation $5x^3 - 2x - 4 = 0$, then $\alpha^3 + \beta^3 + \gamma^3 =$

(A) $\frac{12}{5}$
(B) $\frac{18}{29}$
(C) 4
(D) -4

Answer: (A) $\frac{12}{5}$ · The council's preliminary key

Q273 TS EAMCET 2022 · 19 Jul · Shift 1 MCQ

If the roots of $x^5 - ax^4 + bx^3 - cx^2 + dx - 1 = 0$ are all positive such that their arithmetic mean and geometric mean are equal, then $a + b + c + d =$

(A) 10
(B) 15
(C) 20
(D) 30

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

Q274 TS EAMCET 2022 · 19 Jul · Shift 1 MCQ

The equation of lowest degree with rational coefficients having roots $\sqrt{3} + \sqrt{2}i$ and $\sqrt{3} - \sqrt{2}$ is

(A) $(x^4 - 2x^2 + 25)(x^4 - 10x^2 + 1) = 0$
(B) $(x^2 - 2\sqrt{3}\,x + 5)(x^2 - 2\sqrt{3}\,x + 1) = 0$
(C) $(x^4 - 2x^2 + 25)(x^4 + 10x^2 + 1) = 0$
(D) $(x^4 - 10x^2 + 1)(x^4 + 2x^2 + 25) = 0$

Answer: (A) $(x^4 - 2x^2 + 25)(x^4 - 10x^2 + 1) = 0$ · The council's preliminary key

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Q275 TS EAMCET 2022 · 19 Jul · Shift 1 MCQ

The number of non-real roots of the equation $x^{10} - 3x^8 + 5x^6 - 5x^4 + 3x^2 - 1 = 0$ is

(A) 8
(B) 6
(C) 4
(D) 2

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

Q276 TS EAMCET 2022 · 19 Jul · Shift 2 MCQ

Let $f(x) = Ax^2 + Bx$, $g(x) = Lx^2 + Mx + N$. Given that $f(2) - g(2) = 1$, $f(3) - g(3) = 4$, $f(4) - g(4) = 9$. Then a root of $f(x) - g(x) = 0$ is

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

Answer: (A) 1 · Checked by our team

Q277 TS EAMCET 2022 · 19 Jul · Shift 2 MCQ

If α, β, γ are the roots of the equation $5x^3 - 3x^2 + 2x - 4 = 0$ then $\sum \alpha^2\beta^2 =$

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

Answer: (D) $\frac{-4}{5}$ · The council's preliminary key

Q278 TS EAMCET 2022 · 19 Jul · Shift 2 MCQ

If α, β, γ are the roots of the equation $x^3 + 4x^2 - 9x - 36 = 0$ such that $\alpha + \beta = 0$, then $\alpha^2 + 2\beta^2 + 3\gamma^2 =$

(A) 75
(B) 61
(C) 34
(D) 27

Answer: (A) 75 · The council's preliminary key

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Q279 TS EAMCET 2022 · 19 Jul · Shift 2 MCQ

If $(2-i)$ is one of the roots of the equation $x^4-9x^3+31x^2-49x+30=0$ and $\alpha,\beta(\alpha<\beta)$ are its real roots then $2\alpha-\beta=$

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

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

Q280 TS EAMCET 2022 · 19 Jul · Shift 2 MCQ

If m and M are respectively the smallest and greatest rational roots of the equation $6x^6-25x^5+31x^4-31x^2+25x-6=0$, then $\mathrm{M}-m=$

(A) 1
(B) 2
(C) 3
(D) 4

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

Q281 TS EAMCET 2022 · 18 Jul · Shift 1 MCQ

If $A=\{x\in\mathbb{R}\,/\,\sqrt{x^2-8x+15}\in\mathbb{R}\}$ and $B=\left\{x\in\mathbb{R}\,/\,\dfrac{x-3}{2x-5}<\dfrac{x-6}{2x-11}\right\}$, then $A\cap B=$

(A) ϕ
(B) $\left(\frac{5}{2},3\right]\cup\left[5,\frac{11}{2}\right)$
(C) $\left(\frac{5}{2},\frac{21}{4}\right)$
(D) $\left(\frac{5}{2},\frac{11}{2}\right)$

Answer: (B) $\left(\frac{5}{2},3\right]\cup\left[5,\frac{11}{2}\right)$ · The council's preliminary key

Q282 TS EAMCET 2022 · 18 Jul · Shift 1 MCQ

If the extreme value of $3x-2x^2+1$ is k then the set of all real values of x for which $kx^2+2x+1>0$ is

(A) $\left(\frac{1}{2}, 1\right)$
(B) $\left(-\infty, \frac{1}{2}\right) \cup (1, \infty)$
(C) $(-\infty, \infty)$
(D) $\left(-\infty, \frac{17}{8}\right)$

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

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Q283 TS EAMCET 2022 · 18 Jul · Shift 1 MCQ

If α, β, γ are the roots of the equation $x^3 - 5x^2 - 2x + 24 = 0$ then $\frac{\beta\gamma}{\alpha} + \frac{\gamma\alpha}{\beta} + \frac{\alpha\beta}{\gamma} =$

(A) 244
(B) $\frac{-1}{6}$
(C) 61
(D) $\frac{-61}{6}$

Answer: (D) $\frac{-61}{6}$ · The council's preliminary key

Q284 TS EAMCET 2022 · 18 Jul · Shift 1 MCQ

If α, β, γ are the roots of the equation $3x^3 - 26x^2 + 52x - 24 = 0$ such that α, β, γ are in geometric progression and $\alpha < \beta < \gamma$, then $3\alpha + 2\beta + \gamma =$

(A) $\frac{68}{3}$
(B) $\frac{56}{3}$
(C) 12
(D) 24

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

Q285 TS EAMCET 2022 · 18 Jul · Shift 1 MCQ

Let $p(x)$ be a quadratic polynomial with real coefficients. If $p(x) = 0$ has only purely imaginary roots, then the zeroes of the polynomial $p(p(x))$ are

(A) only real numbers
(B) only purely imaginary numbers
(C) only rational numbers
(D) only complex numbers of the form $a + ib$ with $a \neq 0$ and $b \neq 0$

Answer: (D) only complex numbers of the form $a + ib$ with $a \neq 0$ and $b \neq 0$ · The council's preliminary key

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Q286 TS EAMCET 2022 · 18 Jul · Shift 1 MCQ

If α, β, γ are the roots of the equation $4x^3 + 12x^2 - 7x + 165 = 0$ and $\alpha + 5,\ \beta + 5,\ \gamma + 5$ are the roots of the equation $ax^3 + bx^2 + cx + d = 0$ then the product of the roots of the second equation is

(A) 27
(B) 0
(C) -3
(D) $3\sqrt{5} + 4$

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

Q287 TS EAMCET 2022 · 18 Jul · Shift 2 MCQ

If the quadratic equations $x^2 - 7x + 3c = 0$ and $x^2 + x - 5c = 0$ have a common root, then for non-zero real value of c the sign of the expression $x^2 - 3x + c$ is

(A) negative for all $x \in \mathbb{R}$
(B) positive for all $x \in (1, 3)$
(C) negative for all $x \in (1, 3)$
(D) positive for all $x \in \mathbb{R}$

Answer: (D) positive for all $x \in \mathbb{R}$ · The council's preliminary key

Q288 TS EAMCET 2022 · 18 Jul · Shift 2 MCQ

Let $f(x) = \frac{6x^2 - 18x + 21}{6x^2 - 18x + 17}$. If m is the maximum value of $f(x)$ and $f(x) > n\ \forall x \in \mathbb{R}$ Then $14m - 7n =$

(A) -1
(B) 23
(C) 35
(D) 42

Answer: (B) 23 · The council's preliminary key

Q289 TS EAMCET 2022 · 18 Jul · Shift 2 MCQ

If α, β, γ are the roots of the equation $x^3 + x^2 + x + r = 0$ and $\alpha^3 + \beta^3 + \gamma^3 = 5$, then $r =$

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

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

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Q290 TS EAMCET 2022 · 18 Jul · Shift 2 MCQ

If $\frac{5}{2}$ is the sum of two roots of the equation $6x^6 - 25x^5 + 31x^4 - 31x^2 + 25x - 6 = 0$ then the sum of all non-real roots of the equation is

(A) does not exist
(B) 0
(C) $\frac{5}{3}$
(D) $\frac{2}{5}$

Answer: (C) $\frac{5}{3}$ · The council's preliminary key

Q291 TS EAMCET 2022 · 18 Jul · Shift 2 MCQ

If $1 + \sqrt{2}$ and $2 - i$ are the roots of the equation $x^4 + bx^3 + cx^2 + dx + e = 0$ where b, c, d, e are rational numbers, then the roots of the equation $bx^2 + cx + d = 0$ are

(A) real and different
(B) real and equal
(C) purely imaginary
(D) complex conjugate

Answer: (B) real and equal · The council's preliminary key

Q292 TS EAMCET 2022 · 18 Jul · Shift 2 MCQ

Let the transformed equation of $2x^4 - 8x^3 + 3x^2 - 1 = 0$ so that the term containing the cubic power of x is absent be $2x^4 + bx^2 + cx + d = 0$. Then $b =$

(A) -18
(B) -15
(C) -9
(D) -16

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

Q293 AP EAPCET 2022 · 8 Jul · Shift 1 MCQ

If $x^2 + px + 1$ is a factor of $ax^3 + bx + c$, then

(A) $a^2 + c^2 = ab + 3$
(B) $a^2 - c^2 = ab$
(C) $a^2 - c^2 = -ab$
(D) $a^2 + c^2 = ab$

Answer: (B) $a^2 - c^2 = ab$ · The council's preliminary key

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Q294 AP EAPCET 2022 · 8 Jul · Shift 1 MCQ

The quadratic equation whose sum of the roots is 11 and sum of squares of the roots is 61 is

(A) $x^2 + 11x - 30 = 0$
(B) $x^2 + 11x + 30 = 0$
(C) $x^2 - 11x - 30 = 0$
(D) $x^2 - 11x + 30 = 0$

Answer: (D) $x^2 - 11x + 30 = 0$ · The council's preliminary key

Q295 AP EAPCET 2022 · 8 Jul · Shift 1 MCQ

The sum of the complex roots of the equation $x^4 - 2x^3 + x - 380 = 0$ is

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

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

Q296 AP EAPCET 2022 · 8 Jul · Shift 1 MCQ

The product of real roots of the equation $4x^4 - 24x^3 + 57x^2 + 18x - 45 = 0$ if one of the root is $3 + i\sqrt{6}$ is

(A) $-5/16$
(B) $5/16$
(C) $3/4$
(D) $-3/4$

Answer: (D) $-3/4$ · The council's preliminary key

Q297 AP EAPCET 2022 · 8 Jul · Shift 2 MCQ

The number of pairs of consecutive positive even integers such that the sum of their squares is 290 is

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

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

Q298 AP EAPCET 2022 · 8 Jul · Shift 2 MCQ

If $y^2 + z^2 = ayz$, $z^2 + x^2 = bxz$, $x^2 + y^2 = cxy$ then, the value of $\frac{xz}{y^2} + \frac{y^2}{zx}$ is

(A) $a^2 - b^2 + c^2$
(B) $a^2 + b^2 + c^2$
(C) $ac - b$
(D) $ab - c$

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

Q299 AP EAPCET 2022 · 8 Jul · Shift 2 MCQ

If α, β are the roots of the equation $2x^2 + 6x + k = 0$, then the maximum value of $\left[\frac{\alpha}{\beta} + \frac{\beta}{\alpha}\right]$ when $k < 0$ is

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

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

Q300 AP EAPCET 2022 · 7 Jul · Shift 1 MCQ

Which of the following quadratic equations whose real roots x_1, x_2 satisfy the conditions $x_1^2 + x_2^2 = 5, 3(x_1^5 + x_2^5) = 11(x_1^3 + x_2^3)$?

(A) $x^2 \pm 3x + 2 = 0$
(B) $x^2 \pm 3x + 11 = 0$
(C) $x^2 \pm 5x + 2 = 0$
(D) $x^2 \pm 5x + 11 = 0$

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

Q301 AP EAPCET 2022 · 7 Jul · Shift 1 MCQ

The remainder when the polynomial $2x^5 - 3x^4 + 5x^3 - 3x^2 + 7x - 9$ is divided by $x^2 - x - 3$ is

(A) $-41x - 3$
(B) $41x + 3$
(C) $41x - 3$
(D) $-41x + 3$

Answer: (B) $41x + 3$ · The council's preliminary key

Q302 AP EAPCET 2022 · 7 Jul · Shift 2 MCQ

Let $f : \mathbf{R} \to \mathbf{R}$ be defined by $f(x) = 2x + 3$. If α, β are the roots of the equation $f(x^2) - 2f\left(\frac{x}{2}\right) - 1 = 0$ then $\alpha^2 + \beta^2 =$

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(A) 13
(B) 25
(C) 5
(D) 18

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

Q303 AP EAPCET 2022 · 7 Jul · Shift 2 MCQ

If α, β are the roots of $ax^2+bx+c=0$, then the quadratic equation whose roots are $\sqrt{5}\alpha$, $\sqrt{5}\beta$ is

(A) $ax^2+\sqrt{5}bx+5c=0$
(B) $ax^2+\sqrt{5}bx+\sqrt{5}c=0$
(C) $ax^2+5bx+\sqrt{5}c=0$
(D) $ax^2+5bx+5c=0$

Answer: (A) $ax^2+\sqrt{5}bx+5c=0$ · The council's preliminary key

Q304 AP EAPCET 2022 · 7 Jul · Shift 2 MCQ

If $a^2+b^2+c^2=1$, a, b, $c\in\mathbb{R}$, then the set of extreme values of $ab+bc+ca$ is

(A) $\left\{\frac{1}{2},2\right\}$
(B) $\{-1,2\}$
(C) $\left\{-1,\frac{1}{2}\right\}$
(D) $\left\{\frac{-1}{2},1\right\}$

Answer: (D) $\left\{\frac{-1}{2},1\right\}$ · The council's preliminary key

Q305 AP EAPCET 2022 · 7 Jul · Shift 2 MCQ

If 2, 3, 6 are the roots of the polynomial $f(x)=x^3+ax^2+bx+c$, where a, b, $c\in\mathbb{C}$. Then the value of a-c is

(A) -11
(B) 36
(C) 25
(D) 11

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

Q306 AP EAPCET 2022 · 7 Jul · Shift 2 MCQ

If $y^2+z^2=3yz$, $z^2+x^2=8zx$, $x^2+y^2=4xy$, then the value of $\frac{y^2}{xz}+\frac{xz}{y^2}$ is

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

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

Q307 AP EAPCET 2022 · 6 Jul · Shift 1 MCQ

If $f(x) = ax^2 + bx + c$ satisfies $f(1) + 2f(2) = 0$ and $2f(1) + f(2) = 0$, then $3a + b =$

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

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

Q308 AP EAPCET 2022 · 6 Jul · Shift 1 MCQ

The largest interval containing x for which $x^{12} - x^9 + x^4 - x + 1 > 0$ is

(A) $0 < x < 1$
(B) $-4 < x < 2$
(C) $-\infty < x < \infty$
(D) $-2^{10} < x < 2^{10}$

Answer: (C) $-\infty < x < \infty$ · The council's preliminary key

Q309 AP EAPCET 2022 · 6 Jul · Shift 1 MCQ

Let $a_n, a_{n-1}, \ldots, a_1, a_0 \in \mathbb{C}$ and $f(x) = a_n x^n + a_{n-1}x^{n-1} + \ldots + a_1 x + a_0$ is a polynomial. If the polynomial $f(x)$ is monic then

(A) $a_n \neq 0$
(B) $a_n = 1$
(C) $a_n > 0$
(D) $a_n < 0$

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

Q310 AP EAPCET 2022 · 6 Jul · Shift 1 MCQ

The number of solutions of the equations $x + y + z = 12$; $x^2 + y^2 + z^2 = 50$; $x^3 + y^3 + z^3 = 216$ is

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(A) 6
(B) 24
(C) 3
(D) 9

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

Q311 AP EAPCET 2022 · 6 Jul · Shift 2 MCQ

The sum of squares of roots of the equation $x^{\frac{2}{3}} + x^{\frac{1}{3}} - 2 = 0$ is

(A) 82
(B) 65
(C) 50
(D) 37

Answer: (B) 65 · The council's preliminary key

Q312 AP EAPCET 2022 · 6 Jul · Shift 2 MCQ

If a, b, c, d are real numbers such that $a < b < c < d$, then the roots of the equation $(x-a)(x-c) + 2(x-b)(x-d) = 0$ are

(A) Real & need not be distinct
(B) Real and distinct
(C) Non-real and distinct
(D) Non-real and need not be distinct

Answer: (B) Real and distinct · The council's preliminary key

Q313 AP EAPCET 2022 · 6 Jul · Shift 2 MCQ

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

(A) $-2b$
(B) $-b$
(C) $b - 1$
(D) $b + 1$

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

Q314 AP EAPCET 2022 · 6 Jul · Shift 2 MCQ

a, b, c, d, e, f, g, h be distinct elements in the set $\{-7, -5, -3, -2, 2, 4, 6, 13\}$. The minimum value of $(a+b+c+d)^2 + (e+f+g+h)^2$ is

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(A) 30
(B) 32
(C) 34
(D) 40

Answer: (C) 34 · Checked by our team

Q315 AP EAPCET 2022 · 5 Jul · Shift 1 MCQ

If $S = \{m \in \mathbf{R} : x^2 - 2(1+3m)x + 7(3+2m) = 0$ has distinct roots$\}$, then the number of elements in S is

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

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

Q316 AP EAPCET 2022 · 5 Jul · Shift 1 MCQ

$4^x - 3^{x-\frac{1}{2}} = 3^{x+\frac{1}{2}} - 2^{2x-1} \Rightarrow x =$

(A) $\frac{5}{2}$
(B) $\frac{1}{2}$
(C) $\frac{3}{2}$
(D) $\frac{7}{2}$

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

Q317 AP EAPCET 2022 · 5 Jul · Shift 1 MCQ

The sum of the real roots of the equation $x^4 - 2x^3 + x - 380 = 0$ is

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

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

Q318 AP EAPCET 2022 · 5 Jul · Shift 1 MCQ

If one root of the cubic equation $x^3 + 36 = 7x^2$ is double of another, then the number of negative roots is

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

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

Q319 AP EAPCET 2022 · 5 Jul · Shift 2 MCQ

If $x = -5 + 2\sqrt{-4}$, then the value of $x^4 + 9x^3 + 35x^2 - x + 4$ is

(A) 80
(B) 160
(C) -160
(D) -80

Answer: (C) -160 · The council's preliminary key

Q320 AP EAPCET 2022 · 5 Jul · Shift 2 MCQ

α, β are the roots of $x^2 - 10x - 8 = 0$ with $\alpha > \beta$. If $a_n = \alpha^n - \beta^n$ for $n \in \mathbb{N}$, then the value of $\frac{a_{10} - 8a_8}{5a_9}$ is

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

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

Q321 AP EAPCET 2022 · 5 Jul · Shift 2 MCQ

The number of real values of m so that the equation $x^2 + (2m + 1)x + m = 0$ has equal roots is

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

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

Q322 AP EAPCET 2022 · 5 Jul · Shift 2 MCQ

The number of solutions of the equations $x + y + z = 1$; $x^2 + y^2 + z^2 = 1$; $x^3 + y^3 + z^3 = 1$ is

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(A) 6
(B) 3
(C) 9
(D) 12

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

Q323 AP EAPCET 2022 · 4 Jul · Shift 1 MCQ

The number of positive real roots of the equation $3^{x+1}+3^{-x+1}=10$ is

(A) 3
(B) 2
(C) 1
(D) Infinitely many

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

Q324 AP EAPCET 2022 · 4 Jul · Shift 1 MCQ

The number of real roots of the equation $\sqrt{\frac{x}{1-x}}+\sqrt{\frac{1-x}{x}}=\frac{13}{6}$ is

(A) 1
(B) 2
(C) 3
(D) 4

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

Q325 AP EAPCET 2022 · 4 Jul · Shift 1 MCQ

If $4^x-3^{x-\frac{1}{2}}=3^{x+\frac{1}{2}}-2^{2x-1}$ then the value of x is

(A) 7/2
(B) 5/2
(C) 1/2
(D) 3/2

Answer: (D) 3/2 · The council's preliminary key

Q326 AP EAPCET 2022 · 4 Jul · Shift 2 MCQ

The sum of the real roots of the equation $|x-2|^2+|x-2|-2=0$ is

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

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

Q327 AP EAPCET 2022 · 4 Jul · Shift 2 MCQ

If the difference between the roots of $x^2 + ax + b = 0$ and that of the roots of $x^2 + bx + a = 0$ is same and $a \neq b$, then

(A) $a - b - 4 = 0$
(B) $a - b + 4 = 0$
(C) $a + b + 4 = 0$
(D) $a + b - 4 = 0$

Answer: (C) $a + b + 4 = 0$ · The council's preliminary key

Q328 AP EAPCET 2022 · 4 Jul · Shift 2 MCQ

For what values of $a \in \mathbf{Z}$, the quadratic expression $(x + a)(x + 1991) + 1$ can be factorised as $(x + b)(x + c)$, where $b, c \in \mathbf{Z}$?

(A) 1990
(B) 1989
(C) 1991
(D) 1992

Answer: (B) 1989 · The council's preliminary key

Q329 AP EAPCET 2021 · 5 Oct · Shift 1 MCQ

If α, β are the roots of the equation $x^2 + 2x + 4 = 0$, then $\frac{1}{\alpha^3} + \frac{1}{\beta^3}$ is equal to

(A) $\frac{-1}{4}$
(B) $\frac{1}{4}$
(C) 32
(D) $\frac{1}{32}$

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

Q330 AP EAPCET 2021 · 5 Oct · Shift 1 MCQ

The roots of the equation $x^3 - 6x^2 + 3x + 10 = 0$ are _____

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(A) in geometric progression
(B) in arithmetic progression
(C) in harmonic progression
(D) Positive

Answer: (B) in arithmetic progression · The council's preliminary key

Q331 AP EAPCET 2021 · 5 Oct · Shift 1 MCQ

If α and β are the roots of $ax^2+bx+c=0$ $(a\neq 0)$ and $\alpha+h, \beta+h$ are the roots of $px^2+qx+r=0$ $(p\neq 0)$ then the ratio of the squares of their discriminants is

(A) $a^2 : p^2$
(B) $a : p^2$
(C) $a^2 : p$
(D) $a : 2p$

Answer: (A) $a^2 : p^2$ · The council's preliminary key

Q332 AP EAPCET 2021 · 5 Oct · Shift 1 MCQ

If $f(x)=x^2-3x$ and α, β are the roots of $f(x)=f'(x)$, then $\alpha^2+\beta^2=$ _____

(A) $5+\sqrt{13}$
(B) 31
(C) 19
(D) 25

Answer: (C) 19 · The council's preliminary key

Q333 AP EAPCET 2021 · 25 Aug · Shift 1 MCQ

If $a=\dfrac{x}{y-z}$, $b=\dfrac{y}{z-x}$ & $c=\dfrac{z}{x-y}$ where x, y, z are not all zero, then what is the value of $ab+bc+ca=?$

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

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

Q334 AP EAPCET 2021 · 25 Aug · Shift 1 MCQ

Let m and n be two integers such that $0\leq m\leq 10$ and $0\leq n\leq 10$. Then the number of ordered pairs (m, n) such that $x^2+mx+n=0$ has real roots is _____

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(A) 71
(B) 73
(C) 75
(D) 72

Answer: (B) 73 · The council's preliminary key

Q335 AP EAPCET 2021 · 25 Aug · Shift 1 MCQ

The solution of the equation $2x^3 - x^2 - 22x - 24 = 0$ when two of the roots are in the ration (sic) $3 : 4$ is

(A) $3, 4, \frac{1}{2}$
(B) $\frac{-3}{2}, -2, 4$
(C) $\frac{-1}{2}, \frac{3}{2}, 2$
(D) $\frac{-3}{2}, 2, \frac{5}{2}$

Answer: (B) $\frac{-3}{2}, -2, 4$ · The council's preliminary key

Q336 AP EAPCET 2021 · 25 Aug · Shift 1 MCQ

If the roots of the equation $x^3 - ax^2 + bx - c = 0$ are in H.P, then the mean of the roots is

(A) $\frac{a}{3c}$
(B) $\frac{b}{3c}$
(C) a
(D) $\frac{3c}{b}$

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

Q337 AP EAPCET 2021 · 25 Aug · Shift 1 MCQ

If $x^2 + px + 1$ is a factor of $ax^3 + bx + c$, then

(A) $a^2 + c^2 = -ab$
(B) $a^2 - c^2 = -ab$
(C) $a^2 - c^2 = ab$
(D) $a^2 + c^2 = ab$

Answer: (C) $a^2 - c^2 = ab$ · The council's preliminary key

Q338 AP EAPCET 2021 · 25 Aug · Shift 2 MCQ

If α, β, γ are the roots of the equation $x^3 + 3x^2 - 7x + 5 = 0$, then the value of $\frac{1}{\alpha} + \frac{1}{\beta} + \frac{1}{\gamma}$ is

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

Answer: (B) $\frac{7}{5}$ · The council's preliminary key

Q339 AP EAPCET 2021 · 25 Aug · Shift 2 MCQ

The condition that $x^3 - px^2 + qx - r = 0$ may have two of its roots equal to each other but of opposite sign is

(A) $r = pq$
(B) $r = 2p^3 + pq$
(C) $r = p^2q$
(D) $r = p^2q^2$

Answer: (A) $r = pq$ · The council's preliminary key

Q340 AP EAPCET 2021 · 24 Aug · Shift 1 MCQ

The equations $x^2 - ax + b = 0$ and $x^2 + bx - a = 0$ have a common root, then

(A) $a = b$
(B) $a + b = 1$
(C) $a + b = 0$ or $a - b = 1$
(D) $a - b = 2$

Answer: (C) $a + b = 0$ or $a - b = 1$ · The council's preliminary key

Q341 AP EAPCET 2021 · 24 Aug · Shift 1 MCQ

Let $Q(x)$ be a polynomial of degree n. If $Q(1) = 1$ and $\frac{Q(2x)}{Q(x+1)} + \frac{56}{x+7} - 8 = 0$, then the value of ${}^nC_0 + {}^nC_1 + \cdots + {}^nC_n =$

(A) 32
(B) 64
(C) 8
(D) 16

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

Q342 AP EAPCET 2021 · 24 Aug · Shift 1 MCQ

Suppose that the equation $ax^2 + bx + c = 0$ has roots α and β, both of which are different from $\frac{1}{3}$, then an equation whose roots are $\frac{1}{3\alpha - 1}$ and $\frac{1}{3\beta - 1}$ is _____

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(A) $(a+3b+9c)x^2+(3b+2a)x+a=0$
(B) $(a+3b+9c)x^2-(3b+2a)x+a=0$
(C) $(a+3b+9c)x^2+(3b-2a)x+a=0$
(D) $(a+3b+9c)x^2-(3b-2a)x+a=0$

Answer: (A) $(a+3b+9c)x^2+(3b+2a)x+a=0$ · The council's preliminary key

Q343 AP EAPCET 2021 · 24 Aug · Shift 2 MCQ

For the equation $x^2-5|x|-14=0$,

(A) all roots are real
(B) all the roots are imaginary
(C) Two roots are real
(D) No real roots

Options (1) or (3) were accepted. More than one answer was accepted. · The council's preliminary key

Q344 AP EAPCET 2021 · 24 Aug · Shift 2 MCQ

If α, β and γ are the roots of the equation $x^3-3x^2+x+5=0$ then $y=\sum\alpha^2+\alpha\beta\gamma$ satisfies the equation

(A) $y^3+y+2=0$
(B) $y^3-y^2-y-2=0$
(C) $y^3+3y^2-y-3=0$
(D) $y^3+4y^2+5y+20=0$

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

Q345 AP EAPCET 2021 · 24 Aug · Shift 2 MCQ

If $mn=3$ and $\frac{1}{m}+\frac{1}{n}=\frac{4}{3}$, then the value of $0.1+0.1^{\frac{1}{m}}+0.1^{\frac{1}{n}}$ is _____

(A) $0.2+0.1^{\frac{1}{3}}$
(B) $0.1+0.1^{\frac{1}{3}}+0.1^{\frac{1}{2}}$
(C) $0.1+0.1^{\frac{4}{3}}+0.1^{\frac{1}{2}}$
(D) $0.1+0.1^{\frac{1}{4}}+0.1^{\frac{1}{2}}$

Answer: (A) $0.2+0.1^{\frac{1}{3}}$ · The council's preliminary key

Q346 AP EAPCET 2021 · 24 Aug · Shift 2 MCQ

Which of the following condition imply that roots of the equation $\left(\frac{1}{4}\right)x^2+bx+c=0$ are integers?

(A) $b^2 - c > 0$

(B) b & c are even integers

(C) $b^2 - c$ is the square of an integer and b is an integer

(D) b & c are integers

Answer: (C) $b^2 - c$ **is the square of an integer and** b **is an integer** · The council's preliminary key

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Q347 AP EAPCET 2021 · 23 Aug · Shift 1 MCQ

If α, β, γ are the roots of the equation $x^3 - 6x^2 + 11x + 6 = 0$, then $\sum \alpha^2\beta + \sum \alpha\beta^2$ is equal to

(A) 80

(B) 84

(C) 90

(D) -84

Answer: (B) 84 · The council's preliminary key

Q348 AP EAPCET 2021 · 23 Aug · Shift 1 MCQ

If α, β, γ are roots of the equation $x^3 + 4x - 19 = 0$. Then the value of $\frac{\alpha^3}{19-4\alpha} + \frac{\beta^3}{19-4\beta} + \frac{\gamma^3}{19-4\gamma} =$

(A) 0

(B) 3

(C) -3

(D) 2

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

Q349 AP EAPCET 2021 · 23 Aug · Shift 1 MCQ

If $f(x) = x^4 - 2x^3 + 3x^2 - ax + b$ is divided by $x - 1$ and $x + 1$, the remainders are 5 and 19 respectively. If $f(x)$ is divided by $x - 2$, the remainder is _____

(A) 8

(B) 5

(C) 10

(D) 12

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

Q350 AP EAPCET 2021 · 23 Aug · Shift 1 MCQ

Let a, b, c be positive real numbers. If $\frac{x^2-bx}{ax-c} = \frac{m-1}{m+1}$ has two roots which are numerically equal but opposite in sign, then the value of 'm' is

(A) c
(B) $\frac{1}{c}$
(C) $\frac{a+b}{a-b}$
(D) $\frac{a-b}{a+b}$

Answer: (D) $\frac{a-b}{a+b}$ · The council's preliminary key

Q351 AP EAPCET 2021 · 23 Aug · Shift 2 MCQ

The number of real roots of the equation $\frac{(x^2+1)^3}{x^3}+\frac{x^2+1}{3x}=0\ (x\neq 0)$ is

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

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

Q352 AP EAPCET 2021 · 23 Aug · Shift 2 MCQ

If $\alpha,\beta,\gamma,\delta$ are zeroes of the polynomial equation $x^4-3x^2+6x-12=0$ then the value of $\frac{\alpha+\beta+\gamma}{\delta^2}+\frac{\alpha+\delta+\gamma}{\beta^2}+\frac{\alpha+\beta+\delta}{\gamma^2}+\frac{\delta+\beta+\gamma}{\alpha^2}=$

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

Answer: (B) $\frac{-1}{2}$ · Checked by our team

Q353 AP EAPCET 2021 · 23 Aug · Shift 2 MCQ

If one of the roots of the equation $x^2+px+q=0$ is equal to the square of the other then _____

(A) $p(q^2-3p)=q(p-1)$
(B) $p(3p-q^2)=p(p+1)$
(C) $p(3q-p^2)=q(q-1)$
(D) $p(3q-p^2)=q(q+1)$

Answer: (D) $p(3q-p^2)=q(q+1)$ · The council's preliminary key

Q354 AP EAPCET 2021 · 20 Aug · Shift 1 MCQ

If $f:z\to z$ is defined by $f(x)=x^9-11x^8-2x^7+22x^6+x^4-12x^3+11x^2+x-3\ \forall x\in z$, then $f(11)=$

(A) 7
(B) 8
(C) 6
(D) 9

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

Q355 AP EAPCET 2021 · 20 Aug · Shift 1 MCQ

If one root of the equation $ix^2 - 2(i+1)x + (2-i) = 0$ is $(2-i)$, then the other root is

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

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

Q356 AP EAPCET 2021 · 20 Aug · Shift 1 MCQ

If $2, 1, 1$ are roots of the equation $x^3 - 4x^2 + 5x - 2 = 0$, then the roots of $\left(x+\frac{1}{3}\right)^3 - 4\left(x+\frac{1}{3}\right)^2 + 5\left(x+\frac{1}{3}\right) - 2 = 0$

(A) $\frac{7}{3}, \frac{4}{3}, \frac{4}{3}$
(B) $\frac{5}{3}, \frac{2}{3}, \frac{2}{3}$
(C) $\frac{-5}{3}, \frac{-2}{3}, \frac{-2}{3}$
(D) $\frac{-7}{3}, \frac{-4}{3}, \frac{-4}{3}$

Answer: (B) $\frac{5}{3}, \frac{2}{3}, \frac{2}{3}$ · The council's preliminary key

Q357 AP EAPCET 2021 · 20 Aug · Shift 1 MCQ

If $f(x) = 2x^3 + mx^2 - 13x + n$ and $2, 3$ are the roots of the equation $f(x) = 0$ then the values of m and n are

(A) $-5, -30$
(B) $-5, 30$
(C) $5, 30$
(D) $5, -30$

Answer: (B) $-5, 30$ · The council's preliminary key

Q358 AP EAPCET 2021 · 20 Aug · Shift 2 MCQ

For $a \neq b$, if the equation $x^2 + ax + b = 0$ and $x^2 + bx + a = 0$ have a common root, then the value of $a + b =$

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

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

Q359 AP EAPCET 2021 · 20 Aug · Shift 2 MCQ

If the product of the roots of $9x^3 + 112x^2 - 120x + a = 0$ is 12, then the value of 'a' is _____

(A) -12
(B) 12
(C) -108
(D) 108

Answer: (C) -108 · The council's preliminary key

Q360 AP EAPCET 2021 · 20 Aug · Shift 2 MCQ

$2 + \sqrt{5}, 1$ are roots of the cubic equation given by

(A) $x^3 + 3x^2 - 3x - 1 = 0$
(B) $x^3 - 3x^2 + 3x - 1 = 0$
(C) $x^3 - 5x^2 + 3x + 1 = 0$
(D) $x^3 + 5x^2 - 3x + 1 = 0$

Answer: (C) $x^3 - 5x^2 + 3x + 1 = 0$ · The council's preliminary key

Q361 AP EAPCET 2021 · 19 Aug · Shift 1 MCQ

If $(x^2 + 5x + 5)^{x+5} = 1$ then the number of integers satisfying this equation is

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

Answer: (C) 4 · Checked by our team

Q362 AP EAPCET 2021 · 19 Aug · Shift 1 MCQ

Let $f(x) = x^3 + ax^2 + bx + c$ be polynomial with integer coefficients. If the roots of $f(x)$ are integer and are in Arithmetic Progression, then 'a' cannot take the value _____

(A) -642
(B) 1214
(C) 1323
(D) 1626

Answer: (B) 1214 · The council's preliminary key

Q363 AP EAPCET 2021 · 19 Aug · Shift 1 MCQ

The sum of the roots of the equation $e^{4t} - 10e^{3t} + 29e^{2t} - 22e^{t} + 4 = 0$ is _____

(A) $\log_e 10$
(B) $2\log_e 2$
(C) $\log_2 29$
(D) $2\log_{10} 2$

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

Q364 AP EAPCET 2021 · 19 Aug · Shift 2 MCQ

If α, β are the roots of $11x^2 + 12x - 13 = 0$, then $\frac{1}{\alpha^2} + \frac{1}{\beta^2} =$? (approximately close to)

(A) 4.54
(B) 3.54
(C) 2.54
(D) 1.54

Answer: (C) 2.54 · The council's preliminary key

Q365 AP EAPCET 2021 · 19 Aug · Shift 2 MCQ

The value of 'a' for which the equations $x^3 + ax + 1 = 0$ and $x^4 + ax^2 + 1 = 0$ have a common root is

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

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

Q366 AP EAPCET 2021 · 19 Aug · Shift 2 MCQ

If 'a' is a positive integer such that roots of the equation $7x^2 - 13x + a = 0$ are rational numbers, then the smallest possible value of 'a' is _____

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(A) 5
(B) 6
(C) 7
(D) 8

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

Q367 AP EAPCET 2021 · 19 Aug · Shift 2 MCQ

Let p and q be the roots of the equation $x^2 - 2x + A = 0$ and let r and s be the roots of the equation $x^2 - 18x + B = 0$. If $p < q < r < s$ are in A.P. then the values of A and B are

(A) $-3,\ 77$
(B) $3,\ -77$
(C) $3,\ 77$
(D) $-3,\ -77$

Answer: (A) $-3,\ 77$ · The council's preliminary key

Q368 TS EAMCET 2021 · 6 Aug · Shift 1 MCQ

Let $f(x) = ax^2 + bx + c$ and GCD of a, b, c is 1. If $\frac{-7 + \sqrt{11}\,i}{6}$ is a root of $f(x) = 0$ and $f\left(\frac{x}{k}\right) - L = (x + 4)(3x - 5)$ then k and L are respectively

(A) $1, -15$
(B) $1, 25$
(C) $7, -15$
(D) $7, 25$

Answer: (B) $1, 25$ · The council's preliminary key

Q369 TS EAMCET 2021 · 6 Aug · Shift 1 MCQ

For $\forall x \in \mathbb{R}$ the minimum value $\frac{1}{3}$ and the maximum value 3 of $\frac{x^2 + x + 1}{x^2 - x + 1}$ exist at l and m respectively, then $l + m =$

(A) -22
(B) 0
(C) 17
(D) -7

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

Q370 TS EAMCET 2021 · 6 Aug · Shift 1 MCQ

If 2 and 3 are the two roots of the equation $2x^3 + mx^2 - 13x + n = 0$, then the values of m, n are respectively

(A) $-5, -30$
(B) $-5, 30$
(C) $5, 30$
(D) $5, -30$

Answer: (B) $-5, 30$ · The council's preliminary key

Q371 TS EAMCET 2021 · 6 Aug · Shift 1 MCQ

If $-1+i$ is a root of the equation $x^4+4x^3+5x^2+2x-2=0$, then the real roots of this equation are

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

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

Q372 TS EAMCET 2021 · 6 Aug · Shift 2 MCQ

Suppose α is minimum value of x^2+bx+5 and β is maximum value of $-x^2+ax+5$. If $[\alpha, \beta]$ is the interval of maximum length for x in which $x^2-10x+24 \leq 0$, then $a^2b^2 =$

(A) 25
(B) 16
(C) 4
(D) 18

Answer: (B) 16 · The council's preliminary key

Q373 TS EAMCET 2021 · 6 Aug · Shift 2 MCQ

If the minimum value of the quadratic expression x^2+5x-2 is M and it exists at a then $\frac{M}{a} =$

(A) 3.3
(B) $\frac{33}{5}$
(C) 2.5
(D) -0.25

Answer: (A) 3.3 · The council's preliminary key

Q374 TS EAMCET 2021 · 6 Aug · Shift 2 MCQ

If α, β, γ are the roots of $x^3-3x^2-4x+12=0$ then $\sum(\alpha+\beta)^2 =$

(A) 10
(B) -10
(C) 26
(D) -26

Answer: (C) 26 · The council's preliminary key

Q375 TS EAMCET 2021 · 6 Aug · Shift 2 MCQ

Let α, β, γ $(\alpha < \beta < \gamma)$ be roots of $ax^3 + bx^2 + cx + d = 0$ and u, v, w $(u < v < w)$ be roots of $ak^3x^3 + bk^2x^2 + ckx + d = 0$. If $\beta^2 = \alpha\gamma$, then

(A) $v = \frac{2vw}{u+w}$ (sic)
(B) $2v = u + w$
(C) $v^2 = uw$
(D) $v^2 = 2uw$

Answer: (C) $v^2 = uw$ · The council's preliminary key

Q376 TS EAMCET 2021 · 5 Aug · Shift 1 MCQ

If $x^2 - 5x - 14 > 0 \Rightarrow x$ lie outside $[\alpha, \beta]$, then $\frac{\alpha}{\beta} =$

(A) $\frac{-2}{7}$
(B) $\frac{-7}{2}$
(C) $\frac{2}{7}$
(D) $\frac{7}{2}$

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

Q377 TS EAMCET 2021 · 5 Aug · Shift 1 MCQ

For $x \in \mathbb{R} \setminus \{-6\}$, the value of $\frac{(x+2)(x+5)}{(x+6)}$ does not lie in the interval

(A) $[-9, -1]$
(B) $[-5, -2]$
(C) $(-5, -2)$
(D) $(-9, -1)$

Answer: (D) $(-9, -1)$ · The council's preliminary key

Q378 TS EAMCET 2021 · 5 Aug · Shift 1 MCQ

If $x = 2 + 2^{2/3} + 2^{1/3}$, then $x^3 - 6x^2 + 6x =$

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

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

Q379 TS EAMCET 2021 · 5 Aug · Shift 1 MCQ

The roots of the cubic equation $3x^3 + 4x^2 - 5x - 2 = 0$ are diminished by h, and a cubic equation with these diminished roots is formed. If the transformed equation does not contain x^2 term, then the roots of the transformed equation are

(A) $\frac{-7}{3}, \frac{2}{3}, \frac{5}{3}$
(B) $\frac{7}{3}, \frac{-2}{3}, \frac{-5}{3}$
(C) $\frac{13}{9}, \frac{-14}{9}, \frac{1}{9}$
(D) $\frac{-13}{9}, \frac{14}{9}, \frac{-1}{9}$

Answer: (C) $\frac{13}{9}, \frac{-14}{9}, \frac{1}{9}$ · The council's preliminary key

Q380 TS EAMCET 2021 · 5 Aug · Shift 2 MCQ

$f(x) = ax^2 - bx - a$ is a quadratic expression. If K is the least real number such that $f(x) \leq K\ \forall x \in \mathbb{R}$, then

(A) $K = 0$
(B) $K < -2$
(C) $K > 0$
(D) $-1 < K < 0$

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

Q381 TS EAMCET 2021 · 5 Aug · Shift 2 MCQ

Assertion (A): The maximum value of $-x^2 + 3x + 1$ is $\frac{11}{4}$
Reason (R): If $a < 0$, the maximum value of $ax^2 + bx + c$ exist at $x = \frac{-b}{2a}$
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 · The council's preliminary key

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Q382 TS EAMCET 2021 · 5 Aug · Shift 2 MCQ

If $f(x) \equiv x^2 + ax + 2 = 0$ and $g(x) \equiv x^2 + 2x + a = 0$ have only one real common root, then sum of the roots of $f(x) + g(x) = 0$ is

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

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

Q383 TS EAMCET 2021 · 5 Aug · Shift 2 MCQ

If the roots of the equation $3x^3 - 26x^2 + 52x - 24 = 0$ are in geometric progression, then the sum of two of its roots is

(A) $\frac{8}{3}$
(B) $\frac{10}{3}$
(C) 9
(D) 10

Answer: (A) $\frac{8}{3}$ · The council's preliminary key

Q384 TS EAMCET 2021 · 4 Aug · Shift 1 MCQ

If $\frac{\alpha}{\alpha+1}$ and $\frac{\beta}{\beta+1}$ are the roots of the quadratic equation $x^2 + 7x + 3 = 0$, then the equation having roots α and β is

(A) $3x^2 - x - 3 = 0$
(B) $11x^2 + 13x + 3 = 0$
(C) $13x^2 + 11x + 13 = 0$
(D) $11x^2 + 3x + 13 = 0$

Answer: (B) $11x^2 + 13x + 3 = 0$ · The council's preliminary key

Q385 TS EAMCET 2021 · 4 Aug · Shift 1 MCQ

If $y = \frac{x^2+14x+9}{x^2+2x+3}$, $\forall x \in \mathbb{R}$, then the interval of maximum length in which y lies is

(A) $[-5, 4]$
(B) $[-4, 5]$
(C) $\left[\frac{1}{3}, 3\right]$
(D) $\left[\frac{-1}{3}, 3\right]$

Answer: (A) $[-5, 4]$ · The council's preliminary key

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Q386 TS EAMCET 2021 · 4 Aug · Shift 1 MCQ

The equation whose roots are squares of the roots of $x^4 - 2x^3 + 6x - 21 = 0$ is

(A) $x^4 - 4x^3 - 18x^2 - 36x + 441 = 0$
(B) $x^4 + 18x^3 - 4x^2 + 36x + 441 = 0$
(C) $x^4 - 2x^3 + 4x^2 + 6x + 441 = 0$
(D) $x^4 + 3x^3 - 5x^2 + 6x + 441 = 0$

Answer: (A) $x^4 - 4x^3 - 18x^2 - 36x + 441 = 0$ · The council's preliminary key

Q387 TS EAMCET 2021 · 4 Aug · Shift 1 MCQ

If α, β, γ are the roots of $x^3 - x + 1 = 0$, then $\frac{1+\alpha}{1-\alpha} + \frac{1+\beta}{1-\beta} + \frac{1+\gamma}{1-\gamma} =$

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

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

Q388 TS EAMCET 2021 · 4 Aug · Shift 2 MCQ

The smallest negative integer satisfying both the quadratic inequalities $x^2 < 4x + 77$ and $x^2 > 4$ is

(A) -3
(B) -6
(C) -2
(D) -7

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

Q389 TS EAMCET 2021 · 4 Aug · Shift 2 MCQ

If the roots of equation $x^2 - 2cx + ab = 0$ are real and unequal, then the roots of $x^2 - 2(a+b)x + a^2 + b^2 + 2c^2 = 0$ are

(A) real and unequal
(B) imaginary
(C) irrational and unequal
(D) real and equal

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

Q390 TS EAMCET 2021 · 4 Aug · Shift 2 MCQ

If $f(x)$ is a polynomial of degree n with rational coefficients and $1 + 2i$, $2 - \sqrt{3}$ and 5 are three roots of $f(x) = 0$, then the least value of n is

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(A) 5
(B) 4
(C) 3
(D) 6

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

Q391 TS EAMCET 2021 · 4 Aug · Shift 2 MCQ

If $x^2 - 3x + 2$ is a factor of $x^4 - ax^2 + b$, then the equation whose roots are a and b is

(A) $x^2 - 9x - 20 = 0$
(B) $x^2 - 9x + 20 = 0$
(C) $x^2 + 9x - 20 = 0$
(D) $x^2 + 9x + 20 = 0$

Answer: (B) $x^2 - 9x + 20 = 0$ · The council's preliminary key

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Q392 AP EAMCET 2020 · 7 Oct · Shift 1 MCQ

If the equations $2ax^2 - 3bx + 4c = 0$ and $3x^2 - 4x + 5 = 0$ have a common root, then $\frac{a+b}{b+c}$ is equal to $(a, b, c \in R)$

(A) $\frac{1}{2}$
(B) $\frac{3}{35}$
(C) $\frac{34}{31}$
(D) $\frac{29}{23}$

Answer: (C) $\frac{34}{31}$ · The council's preliminary key

Q393 AP EAMCET 2020 · 7 Oct · Shift 1 MCQ

The polynomial $x^2 - 6x + 12 \in Q[x]$ is

(A) irreducible over $\mathbb{Q}$
(B) reducible over $\mathbb{Q}$
(C) irreducible over $\mathbb{C}$
(D) zero polynomial

Answer: (A) irreducible over $\mathbb{Q}$ · The council's preliminary key

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Q394 AP EAMCET 2020 · 7 Oct · Shift 1 MCQ

Find the remainder when $x^4 - 11x^3 + 44x^2 - 76x + 48$ is divided by $x^2 - 7x + 12$.

(A) 0
(B) 1
(C) $x^2 - 4x + 4$
(D) $x^2 + 4x - 4$

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

Q395 AP EAMCET 2020 · 7 Oct · Shift 1 MCQ

If α, β, γ are the roots of $x^3 + ax^2 + bx + c = 0$ then $\sum \frac{1}{\alpha} =$ _____, if α, β, γ are non-zero

(A) $\frac{-b}{a}$
(B) $\frac{-b}{c}$
(C) $\frac{b}{c}$
(D) $\frac{b}{a}$

Answer: (B) $\frac{-b}{c}$ · The council's preliminary key

Q396 AP EAMCET 2020 · 23 Sep · Shift 1 MCQ

Which of the following is not a root of $f(x) = x^3 - 11x^2 + 36x - 36$?

(A) 2
(B) 4
(C) 3
(D) 6

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

Q397 AP EAMCET 2020 · 23 Sep · Shift 1 MCQ

If α, β, γ are the roots of $x^3 - 2x^2 + 3x - 4 = 0$ then find $\sum \alpha\beta(\alpha + \beta)$

(A) -2
(B) -6
(C) 6
(D) 2

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

Q398 AP EAMCET 2020 · 23 Sep · Shift 1 MCQ

If the bi-quadratic equation $f(x) = x^4 + 2x^3 - 16x^2 - 22x + 7 = 0$ has $2 + \sqrt{3}$ as one of its roots, then which of the following is not a root of $f(x)$?

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

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

Q399 AP EAMCET 2020 · 23 Sep · Shift 1 MCQ

Solve $ix^2-3x-2i=0$

(A) $-i$ only
(B) $-2i$ only
(C) $-i$ and $-2i$
(D) i only

Answer: (C) $-i$ and $-2i$ · The council's preliminary key

Q400 AP EAMCET 2020 · 22 Sep · Shift 1 MCQ

If "$2i$" is a root of $f(z)=z^4+z^3+2z^2+4z-8=0$, then which among the following cannot be a root of $f(z)=0$?

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

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

Q401 AP EAMCET 2020 · 22 Sep · Shift 1 MCQ

If α,β are the roots of $x^2+px+q=0$, then the values of $\alpha^3+\beta^3$ and $\alpha^4+\alpha^2\beta^2+\beta^4$ are respectively _____ & _____

(A) $(3pq-p^3)$ & $(p^4-3p^2q+3q^2)$
(B) $-p(3q-p^2)$ & $(p^2-q)(p^2+3q)$
(C) $(pq-4)$ & (p^4-q^4)
(D) $(3pq-p^3)$ & $(p^2-q)(p^2-3q)$

Answer: (D) $(3pq-p^3)$ & $(p^2-q)(p^2-3q)$ · The council's preliminary key

Q402 AP EAMCET 2020 · 22 Sep · Shift 1 MCQ

The number of solutions for the equation $x^2-5|x|+6=0$ is _____

(A) 4
(B) 3
(C) 2
(D) 1

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

Q403 AP EAMCET 2020 · 22 Sep · Shift 1 MCQ

If α, β, γ are the roots of the equation $x^4 + 3x^3 - 6x^2 + 2x - 4 = 0$, then find the equation having roots $\frac{1}{\alpha}, \frac{1}{\beta}, \frac{1}{\gamma}$

(A) $4x^4 - 2x^3 + 6x^2 - 3x - 1 = 0$
(B) $4x^4 + 2x^3 - 6x^2 + 3x + 1 = 0$
(C) $4x^4 - 2x^3 + 6x^2 - 3x + 1 = 0$
(D) $4x^4 - 2x^3 + 6x^2 + 3x - 1 = 0$

Answer: (A) $4x^4 - 2x^3 + 6x^2 - 3x - 1 = 0$ · The council's preliminary key

Q404 AP EAMCET 2020 · 22 Sep · Shift 1 MCQ

If the roots of the equation $x^3 - 6x^2 + 11x - 6 = 0$ are α, β and γ. Then the equation whose roots are $\alpha^2, \beta^2, \gamma^2$ among the following, is _____

(A) $x^3 + 14x^2 + 49x - 36 = 0$
(B) $x^3 - 14x^2 + 49x - 36 = 0$
(C) $x^3 - 14x^2 - 49x + 36 = 0$
(D) $x^3 - 14x^2 - 49x - 36 = 0$

Answer: (B) $x^3 - 14x^2 + 49x - 36 = 0$ · The council's preliminary key

Q405 AP EAMCET 2020 · 22 Sep · Shift 2 MCQ

If α, β, γ are the roots of the equation $3x^3 - 9x^2 + 5x - 7$, then what is the value of $\alpha + \beta + \gamma$?

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

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

Q406 AP EAMCET 2020 · 22 Sep · Shift 2 MCQ

If the roots of $x^3 - px^2 + qx - r = 0$ are in A.P. then _____

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(A) $2p^3 - 9pq + 27r = 0$
(B) $2p^3 + 9pq - 27r = 0$
(C) $2p^3 - 8pq + 27r = 0$
(D) $2p^3 - 9pq + 28r = 0$

Answer: (A) $2p^3 - 9pq + 27r = 0$ · The council's preliminary key

Q407 AP EAMCET 2020 · 22 Sep · Shift 2 MCQ

For which value of 'k', the roots of equation $2x^2 + 5x + k = 0$ are rational?

(A) $\frac{5}{8}$
(B) $\frac{25}{8}$
(C) $\frac{25}{4}$
(D) $\frac{5}{4}$

Answer: (B) $\frac{25}{8}$ · The council's preliminary key

Q408 AP EAMCET 2020 · 22 Sep · Shift 2 MCQ

If the roots of the equation $x^3 - ax^2 + bx - c = 0$ are in G.P. then $\frac{b^3}{a^3} =$

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

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

Q409 AP EAMCET 2020 · 21 Sep · Shift 1 MCQ

Solve the equation $3^{x^2-x} = 25 - 4^{x^2-x}$

(A) -1 only
(B) 2 only
(C) Both -1 and 2
(D) No Solution

Answer: (C) Both -1 and 2 · The council's preliminary key

Q410 AP EAMCET 2020 · 21 Sep · Shift 1 MCQ

If α, β, γ are the roots of $f(x) = x^3 - 9x^2 + 26x - 24$, then $\frac{1}{\alpha}, \frac{1}{\beta}, \frac{1}{\gamma}$ are the roots of

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(A) $24x^3 + 26x^2 + 9x - 1$
(B) $24x^3 - 26x^2 + 9x - 1$
(C) $24x^3 + 26x^2 - 9x - 1$
(D) $24x^3 - 26x^2 + 9x + 1$

Answer: (B) $24x^3 - 26x^2 + 9x - 1$ · The council's preliminary key

Q411 AP EAMCET 2020 · 21 Sep · Shift 1 MCQ

What is the quotient of $x^3 - 5x^2 + 2x + 7$ when divided with $(x - 1)$?

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

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

Q412 AP EAMCET 2020 · 21 Sep · Shift 1 MCQ

If $2 + 4i$ is one of the roots of $x^2 + bx + c = 0$ with $b, c \in \mathbf{R}$, then $(b, c) =$

(A) $(4, -20)$
(B) $(4, 20)$
(C) $(-4, -20)$
(D) $(-4, 20)$

Answer: (D) $(-4, 20)$ · The council's preliminary key

Q413 AP EAMCET 2020 · 21 Sep · Shift 1 MCQ

If $(2 + i)$ is a root of the equation $x^3 - 5x^2 + 9x - 5 = 0$, then the other roots are

(A) 1 and $(2 - i)$
(B) -1 and $(3 + i)$
(C) 0 and 1
(D) -1 and $(-2 + i)$

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

Q414 AP EAMCET 2020 · 21 Sep · Shift 2 MCQ

Let $f(x) = x^5 - 9x^4 + 29x^3 - 45x^2 + 54x - 54$ suppose $f(x) = (x - a)^n Q(x)$ where $Q(x)$ is a polynomial not divisible by $(x - a)$. Then

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(A) $a = 1,\ n = 2$
(B) $a = 3,\ n = 1$
(C) $a = 3,\ n = 3$
(D) $a = -1,\ n = 2$

Answer: (C) $a = 3,\ n = 3$ · The council's preliminary key

Q415 AP EAMCET 2020 · 21 Sep · Shift 2 MCQ

Let α and β be the roots of the equation $px^2 + qx + r = 0,\ p \neq 0$. If p, q, r are in A.P. and $\frac{1}{\alpha} + \frac{1}{\beta} = 4$ then the value of $|\alpha - \beta|$ is

(A) $\frac{\sqrt{61}}{9}$
(B) $\frac{2\sqrt{17}}{9}$
(C) $\frac{\sqrt{34}}{9}$
(D) $\frac{2\sqrt{13}}{9}$

Answer: (D) $\frac{2\sqrt{13}}{9}$ · The council's preliminary key

Q416 AP EAMCET 2020 · 21 Sep · Shift 2 MCQ

Solve $(8 - t)^2 < (t^2 - 3t - 10)$

(A) $\left(\frac{74}{13}, 8\right]$
(B) $\left(\frac{74}{13}, \infty\right)$
(C) $(8, \infty)$
(D) $[8, \infty)$

Answer: (B) $\left(\frac{74}{13}, \infty\right)$ · The council's preliminary key

Q417 AP EAMCET 2020 · 18 Sep · Shift 1 MCQ

If the sum of the roots of the quadratic equations is 1 and sum of the squares of the roots is 13, then find that equation

(A) $x^2 + x - 6 = 0$
(B) $x^2 - x + 6 = 0$
(C) $x^2 - x - 6 = 0$
(D) $x^2 + x + 6 = 0$

Answer: (C) $x^2 - x - 6 = 0$ · The council's preliminary key

Q418 AP EAMCET 2020 · 18 Sep · Shift 1 MCQ

Number of roots common to the equations $x^3 + x^2 - 2x - 2 = 0$ and $x^3 - x^2 - 2x + 2 = 0$ is

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

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

Q419 AP EAMCET 2020 · 18 Sep · Shift 1 MCQ

If α and β are non-real roots of $x^3 - x^2 - x - 2 = 0$ then $\alpha^{2020} + \beta^{2020} + \alpha^{2020} \cdot \beta^{2020} =$

(A) 1
(B) 2020
(C) $1 + \alpha + \beta$
(D) -1

Answer: (C) $1 + \alpha + \beta$ · The council's preliminary key

Q420 AP EAMCET 2020 · 18 Sep · Shift 1 MCQ

Find $\alpha^4 + \beta^4$ if α, β are the roots of equation $x^2 + x + 1 = 0$.

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

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

Q421 AP EAMCET 2020 · 18 Sep · Shift 1 MCQ

Which among the following equations has roots which are negatives of the roots of the equation $x^3 - x^2 + x - 4 = 0$?

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

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

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Q422 AP EAMCET 2020 · 18 Sep · Shift 2 MCQ

Let $f(x)$ be a polynomial and a, b be distinct real numbers. Then the remainder in the division of $f(x)$ by $(x-a)(x-b)$ is

(A) $\frac{(x-a)f(a)-(x-b)f(b)}{a-b}$
(B) $\frac{(x-a)f(b)-(x-b)f(a)}{a-b}$
(C) $\frac{(x-a)f(b)-(x-b)f(a)}{b-a}$
(D) $\frac{(x-a)f(a)-(x-b)f(b)}{b-a}$

Answer: (C) $\frac{(x-a)f(b)-(x-b)f(a)}{b-a}$ · The council's preliminary key

Q423 AP EAMCET 2020 · 18 Sep · Shift 2 MCQ

If a, b, c are in Arithmetic Progression (A.P.), then the roots of the equation $ax^2 - 2bx + c = 0$ are

(A) $1, \frac{c}{a}$
(B) $\frac{-1}{a}, -c$
(C) $-1, \frac{-c}{a}$
(D) $-2, \frac{-c}{2a}$

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

Q424 AP EAMCET 2020 · 18 Sep · Shift 2 MCQ

For how many values $a \in \mathbb{C}$, the equations $x^2 - 8x + 7 = 0$ and $x^2 - 2ax + 49 = 0$ have a common root?

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

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

Q425 AP EAMCET 2020 · 18 Sep · Shift 2 MCQ

If the roots of the given equation $(\cos p - 1)x^2 + (\cos p)x + \sin p = 0$ are real, then

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

Answer: (C) $p \in (0, \pi)$ · The council's preliminary key

Q426 AP EAMCET 2020 · 17 Sep · Shift 1 MCQ

The roots of the equation $|x^2 - x - 6| = x + 2$ are

(A) $-2, 1, 4$
(B) $0, 2, 4$
(C) $0, 1, 4$
(D) $-2, 2, 4$

Answer: (D) $-2, 2, 4$ · The council's preliminary key

Q427 AP EAMCET 2020 · 17 Sep · Shift 1 MCQ

If $x \in R$, then one of the solutions of $\sqrt{x} + 1 - |\sqrt{x} - 1| = \sqrt{4x - 1}$ among the following is

(A) $x = \frac{5}{4}$
(B) $x = \frac{-5}{4}$
(C) $x = 0$
(D) $x = 1$

Answer: (A) $x = \frac{5}{4}$ · The council's preliminary key

Q428 AP EAMCET 2020 · 17 Sep · Shift 1 MCQ

If $f(x) \in Q[x]$ be a non-zero polynomial such that all its roots are irrational, then the degree of $f(x)$ is

(A) an even number
(B) an odd number
(C) 0
(D) can't determine

Answer: (D) can't determine · Checked by our team

Q429 AP EAMCET 2020 · 17 Sep · Shift 2 MCQ

If x is complex, the expression $\frac{x^2+34x-71}{x^2+2x-7}$ takes all values which lie in the interval (a, b). find the values of a and b

(A) $a = -1,\ b = 1$
(B) $a = 1,\ b = -1$
(C) $a = 5,\ b = 9$
(D) $a = 9,\ b = 5$

Answer: (C) $a = 5,\ b = 9$ · The council's preliminary key

Q430 AP EAMCET 2020 · 17 Sep · Shift 2 MCQ

Equation $x^5 - 5x^3 + 5x^2 - 1 = 0$ has _____ equal roots

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

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

Q431 AP EAMCET 2020 · 17 Sep · Shift 2 MCQ

What is the reminder of $2x^3 - 5x^2 + 7$ when divided with $(x - 2)$?

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

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

Q432 AP EAMCET 2020 · 17 Sep · Shift 2 MCQ

If the roots of the equation $ax^2 + ax + c = 0$ are in the ratio $p : q$, then $\sqrt{\frac{p}{q}} + \sqrt{\frac{q}{p}} =$

(A) $\sqrt{\frac{a^2}{c}}$
(B) $\sqrt{\frac{a}{2c}}$
(C) $\sqrt{\frac{a}{c}}$
(D) $\sqrt{\frac{a^2}{2c}}$

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

Q433 TS EAMCET 2020 · 14 Sep · Shift 1 MCQ

The number of integral values of x satisfying $9x - 2 < (x + 2)^2 < 12x - 3$ is

(A) not finite
(B) 3
(C) 4
(D) 5

Answer: (B) 3 · Official TGCHE final key

Q434 TS EAMCET 2020 · 14 Sep · Shift 1 MCQ

Sum of the modulii of the complex roots of the equation $\left(x^2 + \frac{1}{x^2}\right) - 5\left(x + \frac{1}{x}\right) + 6 = 0$ is

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

Answer: (D) 2 · Official TGCHE final key

Q435 TS EAMCET 2020 · 14 Sep · Shift 1 MCQ

If $2+\sqrt{3}$ is a root of the equation $f(x)=x^4+2x^3-16x^2-22x+7=0$, then which one of the following is not a root of $f(x)=0$?

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

Answer: (A) $3-\sqrt{2}$ · Official TGCHE final key

Q436 TS EAMCET 2020 · 14 Sep · Shift 1 MCQ

Assertion (A) : If $a_1, a_2, \ldots, a_n$ are the n distinct roots of the equation $x^n-2=0$, then $1+(1-a_1)(1-a_2)\ldots(1-a_{n-1})(1-a_n)=0$
Reason (R) : If $\alpha_1, \alpha_2, \ldots, \alpha_n$ are the n roots of $f(x)\equiv p_0x^n+p_1x^{n-1}+p_2x^{n-2}+\ldots+p_n=0$, then the roots of $f(g(x))=0$ are $g^{-1}(\alpha_i)$, $i=1,2,3,\ldots,n$
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

Options (1) or (2) were accepted. More than one answer was accepted. · Official TGCHE final key

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Q437 TS EAMCET 2020 · 14 Sep · Shift 2 MCQ

If x is real, then the maximum and minimum values of $\frac{x^2+14x+9}{x^2+2x+3}$ are respectively

(A) $4, -5$
(B) $5, -4$
(C) $9, 3$
(D) $24, 6$

Answer: (A) $4, -5$ · Official TGCHE final key

Q438 TS EAMCET 2020 · 14 Sep · Shift 2 MCQ

When $\mathbb{R}$ is the set of all real numbers, $\left\{x \in \mathbb{R} : \frac{\sqrt{12-x-x^2}}{x+10} \leq \frac{\sqrt{12-x-x^2}}{2x+9}\right\} =$

(A) $(-4, 1] \cup \{3\}$
(B) $[-4, 1]$
(C) $[-4, 1] \cup \{3\}$
(D) ϕ, the empty set

Answer: (C) $[-4, 1] \cup \{3\}$ · Official TGCHE final key

Q439 TS EAMCET 2020 · 14 Sep · Shift 2 MCQ

If α and β are two complex roots of the equation $6x^6 - 25x^5 + 31x^4 - 31x^2 + 25x - 6 = 0$, then $\alpha + \beta =$

(A) $\frac{1}{5}$
(B) $\frac{31}{5}$
(C) $\frac{6}{31}$
(D) $\frac{5}{3}$

Answer: (D) $\frac{5}{3}$ · Official TGCHE final key

Q440 TS EAMCET 2020 · 14 Sep · Shift 2 MCQ

If α is a root of multiplicity 3 of the equation $x^5 - 8x^4 + 25x^3 - 38x^2 + 28x - 8 = 0$, then $\alpha^2 - 5\alpha + 6 =$

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

Answer: (A) 0 · Official TGCHE final key

Q441 TS EAMCET 2020 · 11 Sep · Shift 1 MCQ

p and q are two roots of the equation $x^2 + 7x + 3 = 0$. If $\frac{3p}{1-2p}, \frac{3q}{1-2q}$ are the roots of $lx^2 + mx + n = 0$ and the greatest common divisor of l, m, n is 1, then $l - m + n =$

(A) 11
(B) -3
(C) -1
(D) 12

Answer: (C) -1 · Official TGCHE final key

Q442 TS EAMCET 2020 · 11 Sep · Shift 1 MCQ

If the quadratic equations $3x^2 - 7x + 2 = 0$ and $kx^2 + 7x - 3 = 0$ have a common root then the positive value of k is

(A) 6
(B) $11/4$
(C) 4
(D) $7/2$

Answer: (A) 6 · Official TGCHE final key

Q443 TS EAMCET 2020 · 11 Sep · Shift 1 MCQ

If the roots of $x^3 + ax^2 + bx + c = 0$ are in arithmetic progression with common difference 1, then

(A) $9c = a(b - 2)$
(B) $9c = a(2 - b)$
(C) $9c - a^2(b - 2) = 0$
(D) $9c - a^2(2 - b) = 0$

Answer: (A) $9c = a(b - 2)$ · Official TGCHE final key

Q444 TS EAMCET 2020 · 11 Sep · Shift 1 MCQ

If α, β, γ are the roots of the equation $x^3 + 3x^2 - x - 3 = 0$, then $(1 + \alpha^2)(1 + \beta^2)(1 + \gamma^2) =$

(A) 16
(B) 24
(C) 36
(D) 40

Answer: (D) 40 · Official TGCHE final key

Q445 TS EAMCET 2020 · 11 Sep · Shift 2 MCQ

For $n > 2$ and $n \in \mathbb{N}$, the product of the roots of $(x - n)\left((x^2 - 2nx)^2 + (2n^2 - 5)(x^2 - 2nx) + (n^4 - 5n^2 + 4)\right) = 0$ is divisible by

(A) 625
(B) 25
(C) 120
(D) 80

Answer: (C) 120 · Official TGCHE final key

Q446 TS EAMCET 2020 · 11 Sep · Shift 2 MCQ

If α, β are the roots of $ax^2+bx+c=0$ then $\left(\frac{\alpha}{a\beta+b}\right)^3-\left(\frac{\beta}{a\alpha+b}\right)^3=$

(A) 0
(B) 1
(C) $(a+b)^2$
(D) $(a-b)^2$

Answer: (A) 0 · Official TGCHE final key

Q447 TS EAMCET 2020 · 11 Sep · Shift 2 MCQ

The maximum of $\{x\in\mathbb{R}/\sqrt{x+2}>\sqrt{8-x^2}\}=$

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

Answer: (D) $2\sqrt{2}$ · Official TGCHE final key

Q448 TS EAMCET 2020 · 11 Sep · Shift 2 MCQ

Let the roots of the equation $E_1\equiv x^3+x^2+lx+n=0$ be x_i, $(i=1,2,3)$ and the roots of $E_2\equiv x^3+ax^2+bx+c=0$ be $\frac{x_i-1}{2}$. If the equation $E_2=0$ is a reciprocal equation of class one, then the roots of these two equations excluding the common roots are

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

Answer: (C) $\sqrt{3}\,i,-\sqrt{3}\,i,\frac{-1+\sqrt{3}\,i}{2},\frac{-1-\sqrt{3}\,i}{2}$ · Official TGCHE final key

Q449 TS EAMCET 2020 · 11 Sep · Shift 2 MCQ

If $\alpha,\beta,\gamma,\delta$ are the roots of the equation $x^4+x^2+1=0$, then $\frac{\alpha^3+\beta^3+\gamma^3+\delta^3}{\alpha^6+\beta^6+\gamma^6+\delta^6}=$

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

Answer: (A) 0 · Official TGCHE final key

Q450 TS EAMCET 2020 · 10 Sep · Shift 1 MCQ

Let S be the set of all possible integral values of λ in the interval $(-3, 7)$ for which the roots of the quadratic equation $\lambda x^2 + 13x + 7 = 0$ are all rational numbers. Then the sum of the elements in S is

(A) 4
(B) 2
(C) 3
(D) 1

Answer: (A) 4 · Official TGCHE final key

Q451 TS EAMCET 2020 · 10 Sep · Shift 1 MCQ

α is the maximum value of $1 - 2x - 5x^2$ and β is the minimum value of $x^2 - 2x + r$. If $5\alpha x^2 + \beta x + 6 > 0$ for all real values x, then the interval in which r lies is

(A) $(0, 5)$
(B) $(-5, \infty)$
(C) $(-\infty, 7)$
(D) $(-11, 13)$

Answer: (D) $(-11, 13)$ · Official TGCHE final key

Q452 TS EAMCET 2020 · 10 Sep · Shift 1 MCQ

For the equation $x^4 + x^3 - 4x^2 + x + 1 = 0$ the ratio of the sum of the squares of all the roots to the product of the distinct roots is

(A) $1 : 4$
(B) $3 : 5$
(C) $9 : 1$
(D) $4 : 3$

Answer: (C) $9 : 1$ · Official TGCHE final key

Q453 TS EAMCET 2020 · 10 Sep · Shift 1 MCQ

If $\alpha_1, \beta_1, \gamma_1, \delta_1$ are the roots of the equation $ax^4 + bx^3 + cx^2 + dx + e = 0$ and $\alpha_2, \beta_2, \gamma_2, \delta_2$ are the roots of the equation $ex^4 + dx^3 + cx^2 + bx + a = 0$ such that $0 < \alpha_1 < \beta_1 < \gamma_1 < \delta_1$, $0 < \alpha_2 < \beta_2 <$

$\gamma_2 < \delta_2$, $\alpha_1 - \delta_2 = 2 = \beta_1 - \gamma_2$; $\gamma_1 - \beta_2 = \delta_1 - \alpha_2 = 4$, then $a + b + c + d + e =$

(A) 10
(B) 12
(C) 6
(D) 8

Answer: (D) 8 · Official TGCHE final key

Q454 TS EAMCET 2020 · 10 Sep · Shift 2 MCQ

If α and β are the real roots of the equation $\sqrt{\frac{5x}{x-2}} + \sqrt{\frac{x-2}{5x}} = \frac{29}{10}$ and $\alpha > \beta$, then $\sqrt{\alpha^2 - 11^4\beta^2} =$

(A) 64
(B) 36
(C) 100
(D) 6

Answer: (D) 6 · Official TGCHE final key

Q455 TS EAMCET 2020 · 10 Sep · Shift 2 MCQ

The minimum value of $\frac{9\cdot 3^{2x} - 6\cdot 3^x + 4}{9\cdot 3^{2x} + 6\cdot 3^x + 4}$ is

(A) -1
(B) $\frac{1}{2}$
(C) $\frac{1}{4}$
(D) $\frac{1}{3}$

Answer: (D) $\frac{1}{3}$ · Official TGCHE final key

Q456 TS EAMCET 2020 · 10 Sep · Shift 2 MCQ

p is a non-zero real number. If the equation whose roots are the squares of the roots of the equation $x^3 - px^2 + px - 1 = 0$ is identical with the given equation, then $p =$

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

Answer: (C) 3 · Official TGCHE final key

Q457 TS EAMCET 2020 · 10 Sep · Shift 2 MCQ

If the roots of the equation $8x^3 + 6px^2 + 3qx - 27 = 0$ are in a geometric progression, then $q^2 + 9p^2 + 6pq + \frac{q}{p} =$

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(A) -3
(B) -10
(C) 6
(D) 0

Answer: (A) -3 · Official TGCHE final key

Q458 TS EAMCET 2020 · 9 Sep · Shift 1 MCQ

If e^{ix} is a solution of the equation $z^n + p_1 z^{n-1} + p_2 z^{n-2} + \ldots + p_n = 0$, where p_i are real ($i = 1, 2, 3, \ldots, n$), then $p_n \sin nx + p_{n-1} \sin(n-1)x + \ldots + p_1 \sin x + 1 =$

(A) $\cos(n+1)x$
(B) $\sin(n(n+1))x$
(C) 1
(D) 0

Answer: (C) 1 · Official TGCHE final key

Q459 TS EAMCET 2020 · 9 Sep · Shift 1 MCQ

Assertion (A) : $3x^2 - 16x + 4 > -16$ is satisfied for some values of real x in $\left(0, \frac{10}{3}\right)$
Reason (R) : $ax^2 + bx + c$ and a will have the same sign for some values of $x \in \mathbb{R}$ when $b^2 - 4ac > 0$
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: (A) (A) is true, (R) is true and (R) is the correct explanation for (A) · Official TGCHE final key

Q460 TS EAMCET 2020 · 9 Sep · Shift 1 MCQ

If the roots of the quadratic equation $ax^2 + bx + c = 0$ are imaginary, then for all real values of x, the minimum value of the expression $3a^2x^2 + 6abx + 2b^2$ is

(A) $< 4ab$
(B) $> 4ac$
(C) $> -4ac$
(D) $< -4ab$

Answer: (C) $> -4ac$ · Official TGCHE final key

Q461 TS EAMCET 2020 · 9 Sep · Shift 1 MCQ

Let α, β, γ be the roots of the equation $x^3 + px + q = 0$ and $f(x) = 3p^2x^2 + p^2x + 3q$. Then $\sum \alpha^2\beta + \sum \alpha^4 =$

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

Answer: (B) $f(-1)$ · Official TGCHE final key

Q462 TS EAMCET 2020 · 9 Sep · Shift 1 MCQ

If α, β, γ are the roots of the equation $x^3 + ax^2 - bx + c = 0$, then $\sum \beta^2(\gamma + \alpha) =$

(A) $\frac{a^2+b-c}{3ab}$
(B) $ac + b^3$
(C) $\frac{bc+a^2}{3ab}$
(D) $ab + 3c$

Answer: (D) $ab + 3c$ · Official TGCHE final key

Q463 TS EAMCET 2020 · 9 Sep · Shift 2 MCQ

The curves $y = x^2 + 9x + 20$ and $y = x^2 + bx + c$ intersect the X-axis at the points $(\alpha_i, 0)$, $(i = 1, 2, 3, 4)$. If $\alpha_1 < \alpha_2 < \alpha_3 < \alpha_4$ be such that $|\alpha_1 - \alpha_3| = |\alpha_2 - \alpha_4| = 8$, then the sum of all possible values of b and c is

(A) 186
(B) 159
(C) 216
(D) 214

Answer: (B) 159 · Official TGCHE final key

Q464 TS EAMCET 2020 · 9 Sep · Shift 2 MCQ

If $\alpha, \beta, \gamma, \delta$ are the roots of the equation $x^4 - 8x^3 + 11x^2 + 32x - 60 = 0$ and $\alpha < \beta < \gamma < \delta$, then $4\alpha + 3\beta + 2\gamma + \delta =$

(A) 0
(B) 1
(C) 9
(D) 10

Answer: (C) 9 · Official TGCHE final key

Q465 TS EAMCET 2020 · 9 Sep · Shift 2 MCQ

If the roots of $x^4 + x^3 - 4x^2 + x + 1 = 0$ are diminished by α or β, then the equation with the diminished roots does not contain x^2 term. Then $12(\alpha - \beta)^2 =$

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(A) 35
(B) 105
(C) 96
(D) 115

Answer: (A) 35 · Official TGCHE final key

Q466 TS EAMCET 2019 · 6 May · Shift 1 MCQ

If α and β are the least positive integers such that for all $n \in N$, $n^3 + \alpha n$ is divisible by 3 and $n^3 - \beta n$ is divisible by 6, then $\alpha + \beta =$

(A) 4
(B) 3
(C) 2
(D) 1

Answer: (B) 3 · Official TGCHE final key

Q467 TS EAMCET 2019 · 6 May · Shift 1 MCQ

If α_1, α_2 are the roots of $x^2 + ax + 1 = 0$ and α_3, α_4 are the roots of $x^2 + bx + 1 = 0$, then $(\alpha_1 + \alpha_3)(\alpha_2 + \alpha_3)(\alpha_1 + \alpha_4)(\alpha_2 + \alpha_4) =$

(A) $3a^2 - b^2$
(B) $a^2 - 3b^2$
(C) $(a - b)^2$
(D) $(b + a)^2$

Answer: (D) $(b + a)^2$ · Official TGCHE final key

Q468 TS EAMCET 2019 · 6 May · Shift 1 MCQ

Consider the curves given by the following quadratic functions.
$f_1(x) = 5x^2 + 2x + 1$
$f_2(x) = 5x^2 + 6x + 1$
$f_3(x) = x^2 - 7x + 6$
$f_4(x) = 64x^2 + 48x + 9$
If A_1, A_2, A_3 and A_4 denote the lengths of the intercepts on the X-axis made by the above curves respectively, then which of the following is true?

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(A) $A_1 > A_2 > A_3 > A_4 > 0$
(B) $A_4 < A_2 < A_3$
(C) $A_3 < A_2 < A_4$
(D) $A_2 < A_4 < A_3$

Answer: (B) $A_4 < A_2 < A_3$ · Official TGCHE final key

Q469 TS EAMCET 2019 · 6 May · Shift 1 MCQ

The condition to be satisfied in order that one root of $x^3 + bx^2 + cx + d = 0$ is the sum of the other two roots, is

(A) $3d^2 + b^3 = b^2c$
(B) $6d + b^3 = 2bc$
(C) $8d + b^3 = 4bc$
(D) $8d + b^2 = 4bc$

Answer: (C) $8d + b^3 = 4bc$ · Official TGCHE final key

Q470 TS EAMCET 2019 · 6 May · Shift 1 MCQ

If each root of the equation $2x^3 + ax^2 - 8x + b = 0$ is reduced by one, then, in the transformed equation thus formed, the term containing x^2 and the constant term are vanishing. The roots of the original equation are

(A) $1, -3, 2$
(B) $1, 1 \pm \sqrt{7}$
(C) $1, 1, -6$
(D) $1, 3\sqrt{2}, -\sqrt{2}$

Answer: (B) $1, 1 \pm \sqrt{7}$ · Official TGCHE final key

Q471 TS EAMCET 2019 · 6 May · Shift 1 MCQ

If $\sin 2\theta$ and $\cos 2\theta$ are solutions of $x^2 + bx - c = 0$, then

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

Answer: (B) $b^2 + 2c - 1 = 0$ · Official TGCHE final key

Q472 TS EAMCET 2019 · 6 May · Shift 1 MCQ

If the minimum value of $f(x) = 2x^2 + \alpha x + 8$ is the same as the maximum value of $g(x) = -3x^2 - 4x + \alpha^2$, then $\alpha^2 =$

(A) $\frac{150}{27}$
(B) $\frac{160}{27}$
(C) $\frac{170}{27}$
(D) $\frac{181}{27}$

Answer: (B) $\frac{160}{27}$ · Official TGCHE final key

Q473 TS EAMCET 2019 · 4 May · Shift 1 MCQ

If x is real, then the interval in which no value of the expression $\frac{2\left(x^2+2x-11\right)}{2x-5}$ lies, is

(A) $(2,5)$
(B) $(3,6)$
(C) $(3,4)$
(D) $(6,8)$

Answer: (D) $(6,8)$ · Official TGCHE final key

Q474 TS EAMCET 2019 · 4 May · Shift 1 MCQ

The set of all real values of x satisfying the inequalities $x^2-4x+3>0$ and $x^2-2x-8\leq 0$, is

(A) $[-2,1)\cup(3,4]$
(B) $[-1,2)\cup(3,4)$
(C) $[-2,2)\cup(2,4)$
(D) $[0,2)\cup(3,5)$

Answer: (A) $[-2,1)\cup(3,4]$ · Official TGCHE final key

Q475 TS EAMCET 2019 · 4 May · Shift 1 MCQ

If the roots α,β,γ of the equation $x^3-6x^2+px+10=0$ are in arithmetic progression, then $\alpha^3+\beta^3+\gamma^3=$

(A) 132
(B) 134
(C) 629
(D) 645

Answer: (A) 132 · Official TGCHE final key

Q476 TS EAMCET 2019 · 4 May · Shift 1 MCQ

α,β,γ are the roots of the cubic equation $x^3+p_1x^2+p_2x+p_3=0$. If $S_r=\alpha^r+\beta^r+\gamma^r$, $S_1=10$, $S_2=38$ and $S_3=-1840$, then $p_3=$

(A) -30
(B) $\frac{1910}{3}$
(C) 631
(D) -31

Answer: (B) $\frac{1910}{3}$ · Official TGCHE final key

Q477 TS EAMCET 2019 · 4 May · Shift 2 MCQ

If the maximum value of $2x - 7 - ax^2$ cannot exceed 20, then the minimum value of a is

(A) 27
(B) $\frac{1}{13}$
(C) 13
(D) $\frac{1}{27}$

Answer: (D) $\frac{1}{27}$ · Official TGCHE final key

Q478 TS EAMCET 2019 · 4 May · Shift 2 MCQ

A student while solving a quadratic equation in x, he copied its constant term incorrectly and got its roots as 5 and 9. Another student copied the constant term and coefficient of x^2 of the same equation correctly as 12 and 4 respectively. If s, p and Δ denote respectively the sum of the roots, the product of the roots and the discriminant of the correct equation, then $\frac{\Delta}{3p+s} =$

(A) 48
(B) 45
(C) 8
(D) 16

Answer: (C) 8 · Official TGCHE final key

Q479 TS EAMCET 2019 · 4 May · Shift 2 MCQ

The product of the real roots of the equation $(x+1)^4 + (x+3)^4 = 8$ is

(A) 0
(B) 74
(C) $7 - 2\sqrt{3}$
(D) $7 + 2\sqrt{3}$

Answer: (C) $7 - 2\sqrt{3}$ · Official TGCHE final key

Q480 TS EAMCET 2019 · 4 May · Shift 2 MCQ

The sum of all the real numbers satisfying the equation $x^2 + |x-3| = 4$ is

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

Answer: (B) 1 · Official TGCHE final key

Q481 TS EAMCET 2019 · 3 May · Shift 1 MCQ

The set of all values of 'a' for which the expression $\frac{ax^2-2x+3}{2x-3x^2+a}$ assumes all real values for real values of x is

(A) $[2,3]$
(B) $\mathbb{R}-(2,3)$
(C) ϕ
(D) $[1,5]$

Answer: (C) ϕ · Official TGCHE final key

Q482 TS EAMCET 2019 · 3 May · Shift 1 MCQ

If both the roots of the equation $x^2-4ax+1-3a+4a^2=0$ exceed 1, then a lies in the interval

(A) $\left(-\infty, \frac{7-\sqrt{17}}{8}\right)$
(B) $\left(\frac{7+\sqrt{17}}{8}, \infty\right)$
(C) $\left(\frac{7-\sqrt{17}}{8}, \frac{1}{2}\right)$
(D) $\left(\frac{1}{2}, \frac{7+\sqrt{17}}{8}\right)$

Answer: (B) $\left(\frac{7+\sqrt{17}}{8}, \infty\right)$ · Official TGCHE final key

Q483 TS EAMCET 2019 · 3 May · Shift 1 MCQ

If the cubic equation $x^3-ax^2+ax-1=0$ is identical with the cubic equation whose roots are the squares of the roots of the given cubic equation, then the non zero real value of 'a' is

(A) $\frac{1}{2}$
(B) 2
(C) 3
(D) $\frac{7}{2}$

Answer: (C) 3 · Official TGCHE final key

Q484 TS EAMCET 2019 · 3 May · Shift 1 MCQ

If α, β, γ are the roots of the equation $x^3 + px^2 + qx + r = 0$, then $(\alpha + \beta)(\beta + \gamma)(\gamma + \alpha) =$

(A) $p - qr$
(B) $r - pq$
(C) $q - rp$
(D) $r + pq$

Answer: (B) $r - pq$ · Official TGCHE final key

Q485 TS EAMCET 2019 · 3 May · Shift 2 MCQ

The solution set of the inequation $3^x + 3^{1-x} - 4 < 0$, is

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

Answer: (A) $(0, 1)$ · Official TGCHE final key

Q486 TS EAMCET 2019 · 3 May · Shift 2 MCQ

One of the real roots of the equation $x^3 - 6x^2 + 6x - 2 = 0$ is

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

Answer: (C) $\frac{2^{1/3}}{2^{1/3} - 1}$ · Official TGCHE final key

Q487 TS EAMCET 2019 · 3 May · Shift 2 MCQ

Assume that α, β, γ are the roots of $2x^3 + 5x^2 + 5x + 2 = 0$. For $h \in \mathbb{R}$, if $\alpha + h, \beta + h, \gamma + h$ are roots of $a(h)x^3 + b(h)x^2 + c(h)x + d(h) = 0$, then

(A) $c(h) \neq 0,\ \forall h \in \mathbb{R}$

(B) $b\left(-\frac{5}{6}\right) = 0$

(C) $c(-2) = 0$

(D) $d(h)$ vanishes for three distinct real values of h

Answer: (A) $c(h) \neq 0,\ \forall h \in \mathbb{R}$ · Official TGCHE final key

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Q488 AP EAMCET 2019 · 23 Apr · Shift 1 MCQ

If the product of the roots of the equation $x^2 + 4kx + 12e^{3\log k} - 1 = 0,\ (k > 0)$ is 323, then the sum of its roots is

(A) $9k$

(B) 12

(C) -12

(D) $-16k$

Answer: (C) -12 · Official APSCHE final key

Q489 AP EAMCET 2019 · 23 Apr · Shift 1 MCQ

If a and b are the maximum and minimum values of the quadratic expressions $1 - 2x - 5x^2$ and $x^2 - 2x + 5$ respectively, then the set of all values of x for which the expression $5ax^2 + bx + 7$ is positive, is

(A) (a, b)

(B) $(-\infty, 7)$

(C) $(5, \infty)$

(D) $(-\infty, \infty)$

Answer: (D) $(-\infty, \infty)$ · Official APSCHE final key

Q490 AP EAMCET 2019 · 23 Apr · Shift 1 MCQ

If $\left|\frac{x^2 + kx + 1}{x^2 + x + 1}\right| < 3$ for all real numbers x, then the range of the parameter k is

(A) $(0, 4)$

(B) $(-1, 5)$

(C) $(-4, 0)$

(D) $(-5, 1)$

Answer: (B) $(-1, 5)$ · Official APSCHE final key

Q491 AP EAMCET 2019 · 23 Apr · Shift 1 MCQ

Let $a, b, c, d \in \mathbb{R}$. If the equations $2bx^2 + 3cx - d = 0$ and $2ax^2 + 3bx + 4c = 0$ have a common root and $\frac{4bc + ad}{k(b^2 - ac)} = \frac{bd + 4c^2}{4bc + ad}$, then $k =$

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(A) $\frac{9}{2}$
(B) $\frac{2}{9}$
(C) $\frac{1}{9}$
(D) $\frac{1}{3}$

Answer: (A) $\frac{9}{2}$ · Official APSCHE final key

Q492 AP EAMCET 2019 · 22 Apr · Shift 1 MCQ

If $3x^2 - 7x + 2 = 0$ and $15x^2 - 11x + a = 0$ have a common root and a is a positive real number, then the sum of the roots of the equation $15x^2 - ax + 7 = 0$ is

(A) $\frac{76}{15}$
(B) $\frac{38}{15}$
(C) $\frac{2}{15}$
(D) $\frac{36}{15}$

Answer: (C) $\frac{2}{15}$ · Official APSCHE final key

Q493 AP EAMCET 2019 · 22 Apr · Shift 1 MCQ

Let α, β be the roots of the equation $x^2 - |a|x - |b| = 0$ such that $|\alpha| < |\beta|$. If $|a| < \beta - 1$, then the positive root of $\log_{|\alpha|}\left(\frac{x^2}{\beta^2}\right) - 1 = 0$ is

(A) $< |\alpha|$
(B) $< \alpha$
(C) $< \beta$
(D) $> \beta$

Answer: (D) $> \beta$ · Official APSCHE final key

Q494 AP EAMCET 2019 · 22 Apr · Shift 1 MCQ

If $x \in R$ and $1 \leq \frac{3x^2-7x+8}{x^2+1} \leq 2$, then the minimum and maximum values of x are respectively

(A) $1, 2$
(B) $5, 12$
(C) $6, 10$
(D) $1, 6$

Answer: (D) $1, 6$ · Official APSCHE final key

Q495 AP EAMCET 2019 · 22 Apr · Shift 1 MCQ

Let $\phi(x) = \frac{x}{(x^2+1)(x+1)}$. If a, b and c are the roots of the equation $x^3 - 3x + \lambda = 0$ $(\lambda \neq 0)$ then $\phi(a)\,\phi(b)\,\phi(c) =$

(A) λ

(B) $\frac{-\lambda}{(\lambda+2)(\lambda^2+16)}$

(C) $\frac{\lambda}{(\lambda+2)}$

(D) $\frac{\lambda}{(\lambda+2)(\lambda^2+16)}$

Answer: (D) $\frac{\lambda}{(\lambda+2)(\lambda^2+16)}$ · Official APSCHE final key

Q496 AP EAMCET 2019 · 22 Apr · Shift 2 MCQ

If α is the real root and β, γ are the complex roots of the equation $x^3 + 3x^2 + 3x + 28 = 0$ then $2\alpha + 3\beta + 3\gamma =$

(A) -5

(B) 0

(C) 5

(D) -23

Answer: (A) -5 · Official APSCHE final key

Q497 AP EAMCET 2019 · 22 Apr · Shift 2 MCQ

Given that $\alpha, \beta, \gamma, \delta$ are in a geometric progression. If α, β are the roots of $x^2 - x + p = 0$ and γ, δ are the roots of $x^2 - 4x + q = 0$, where p and q are integers, then the ordered pair $(p, q) =$

(A) $(2, 32)$

(B) $(2, -32)$

(C) $(-2, 32)$

(D) $(-2, -32)$

Answer: (D) $(-2, -32)$ · Official APSCHE final key

Q498 AP EAMCET 2019 · 22 Apr · Shift 2 MCQ

If A, B, C are the sets of all values of x, for which $x^2 - 5x - 14$ is positive, $-6x^2 + 2x - 3$ is negative and $4x - 5x^2 + 2$ is positive respectively, then $A \cap B \cap C =$

(A) $(-2, 7)$

(B) ϕ

(C) $\left(\frac{2-\sqrt{14}}{5}, \frac{2+\sqrt{14}}{5}\right)$

(D) $\mathbb{R}$

Answer: (B) ϕ · Official APSCHE final key

Q499 AP EAMCET 2019 · 22 Apr · Shift 2 MCQ

The complete solution set of the inequation $\sqrt{x^2-3x+2} > (3-x)$ is

(A) $\left(\frac{7}{3}, 3\right]$
(B) $(3, \infty)$
(C) $(-\infty, 1] \cup [2, \infty)$
(D) $\left(\frac{7}{3}, \infty\right)$

Answer: (D) $\left(\frac{7}{3}, \infty\right)$ · Official APSCHE final key

Q500 AP EAMCET 2019 · 22 Apr · Shift 2 MCQ

The greatest real root of the equation $6x^4 - 35x^3 + 62x^2 - 35x + 6 = 0$ is

(A) 2
(B) $\frac{5}{2}$
(C) 3
(D) $\frac{7}{2}$

Answer: (C) 3 · Official APSCHE final key

Q501 AP EAMCET 2019 · 21 Apr · Shift 1 MCQ

If α satisfies the equation $\sqrt{\frac{x}{2x+1}} + \sqrt{\frac{2x+1}{x}} = 2$, then the roots of the equation $\alpha^2x^2 + 4\alpha x + 3 = 0$ are

(A) $1, 3$
(B) $-1, 1$
(C) $2, -3$
(D) $3, 4$

Answer: (A) $1, 3$ · Official APSCHE final key

Q502 AP EAMCET 2019 · 21 Apr · Shift 1 MCQ

Let $f(x) = x^2 + 2x + 2$, $g(x) = -x^2 + 2x - 1$ and a, b be the extreme values of $f(x)$, $g(x)$ respectively. If c is the extreme value of $\frac{f}{g}(x)$ (for $x \neq 1$), then $a + 2b + 5c + 4 =$

(A) 2
(B) 1
(C) 4
(D) 3

Answer: (C) 4 · Official APSCHE final key

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Q503 AP EAMCET 2019 · 21 Apr · Shift 1 MCQ

The set of all real numbers satisfying the inequation $x^2 - |x+2| + x > 0$ is

(A) $[-2, -\sqrt{2}) \cup (\sqrt{2}, \infty)$
(B) $(-\infty, -2) \cup (2, \infty)$
(C) $(-\infty, -\sqrt{2}) \cup (\sqrt{2}, \infty)$
(D) $(-\infty, -2) \cup (\sqrt{2}, \infty)$

Answer: (C) $(-\infty, -\sqrt{2}) \cup (\sqrt{2}, \infty)$ · Official APSCHE final key

Q504 AP EAMCET 2019 · 21 Apr · Shift 1 MCQ

If α, β, γ are the roots of $x^3 - 6x^2 + 11x - 6 = 0$, then the equation having the roots $\alpha^2 + \beta^2$, $\beta^2 + \gamma^2$ and $\gamma^2 + \alpha^2$ is

(A) $x^3 - 28x^2 + 245x - 650 = 0$
(B) $x^3 - 28x^2 + 245x + 650 = 0$
(C) $x^3 + 28x^2 - 245x - 650 = 0$
(D) $x^3 + 28x^2 + 245x - 650 = 0$

Answer: (A) $x^3 - 28x^2 + 245x - 650 = 0$ · Official APSCHE final key

Q505 AP EAMCET 2019 · 21 Apr · Shift 2 MCQ

If α, β are the real roots of $x^2 + px + q = 0$ and α^4, β^4 are the roots of $x^2 - rx + s = 0$, then the equation $x^2 - 4qx + 2q^2 - r = 0$ has always

(A) two positive roots
(B) two negative roots
(C) one positive root and one negative root
(D) two real roots

Answer: (D) two real roots · Official APSCHE final key

Q506 AP EAMCET 2019 · 21 Apr · Shift 2 MCQ

If $\dfrac{x - P}{x^2 - 3x + 2}$ takes all real values for $x \in \mathbb{R}$, then the range of P is

(A) $1 \le P \le 2$
(B) $1 < P < 2$
(C) $P < 1$ or $P > 2$
(D) $P \ge 2$ or $P \le 1$

Answer: (B) $1 < P < 2$ · Official APSCHE final key

Q507 AP EAMCET 2019 · 21 Apr · Shift 2 MCQ

$$\left\{x \in \mathbb{R} : \frac{\sqrt{6+x-x^2}}{2x+5} \geq \frac{\sqrt{6+x-x^2}}{x+4}\right\} =$$

(A) $[-2, 3]$

(B) $(-\infty, -4] \cup \left[\frac{-5}{2}, -1\right]$

(C) $[-2, -1] \cup \{3\}$

(D) $(-\infty, -4] \cup [-2, -1]$

Answer: (C) $[-2, -1] \cup \{3\}$ · Official APSCHE final key

Q508 AP EAMCET 2019 · 21 Apr · Shift 2 MCQ

Let θ be an acute angle such that the equation $x^3 + 4x^2 \cos\theta + x \cot\theta = 0$ has multiple roots. Then the value of θ (in radians) is

(A) $\frac{\pi}{3}$

(B) $\frac{\pi}{8}$

(C) $\frac{\pi}{12}$ or $\frac{5\pi}{12}$

(D) $\frac{\pi}{6}$ or $\frac{5\pi}{12}$

Answer: (C) $\frac{\pi}{12}$ or $\frac{5\pi}{12}$ · Official APSCHE final key

Q509 AP EAMCET 2019 · 20 Apr · Shift 1 MCQ

If α and β are the roots of $x^2 + 7x + 3 = 0$ and $\frac{2\alpha}{3-4\alpha}, \frac{2\beta}{3-4\beta}$ are the roots of $ax^2 + bx + c = 0$ and GCD of a, b, c is 1 then $a + b + c =$

(A) 11

(B) 0

(C) 243

(D) 81

Answer: (D) 81 · Official APSCHE final key

Q510 AP EAMCET 2019 · 20 Apr · Shift 1 MCQ

If α, β are the roots of $x^2 + bx + c = 0$, γ, δ are the roots of $x^2 + b_1x + c_1 = 0$ and $\gamma < \alpha < \delta < \beta$, then $(c - c_1)^2 <$

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(A) $(b_1 - b)(bc_1 - b_1c)$
(B) 1
(C) $(b - b_1)^2$
(D) $(c - c_1)(b_1c - b_1c_1)$

Answer: (A) $(b_1 - b)(bc_1 - b_1c)$ · Official APSCHE final key

Q511 AP EAMCET 2019 · 20 Apr · Shift 1 MCQ

Let a, b and c be the sides of a scalane (sic) triangle. If λ is a real number such that the roots of the equation $x^2 + 2(a + b + c)x + 3\lambda(ab + bc + ca) = 0$ are real then the interval in which λ lies is

(A) $\left(-\infty, \frac{4}{3}\right)$
(B) $\left(\frac{5}{3}, \infty\right)$
(C) $\left(\frac{1}{3}, \frac{5}{3}\right)$
(D) $\left(\frac{4}{3}, \infty\right)$

Answer: (A) $\left(-\infty, \frac{4}{3}\right)$ · Official APSCHE final key

Q512 AP EAMCET 2019 · 20 Apr · Shift 1 MCQ

The polynomial equation of degree 4 having real coefficients with three of its roots as $2 \pm \sqrt{3}$ and $1 + 2i$, is

(A) $x^4 - 6x^3 - 14x^2 + 22x + 5 = 0$
(B) $x^4 - 6x^3 - 19x + 22x - 5 = 0$ (sic)
(C) $x^4 - 6x^3 + 19x - 22x + 5 = 0$ (sic)
(D) $x^4 - 6x^3 + 14x^2 - 22x + 5 = 0$

Answer: (D) $x^4 - 6x^3 + 14x^2 - 22x + 5 = 0$ · Official APSCHE final key

Q513 AP EAMCET 2019 · 20 Apr · Shift 2 MCQ

For $x > 2$, the equation $\sqrt{x + 2} - \sqrt{x - 2} = \sqrt{4x - 2}$ has

(A) One solution
(B) Two solutions
(C) More than two solutions
(D) No solution

Answer: (D) No solution · Official APSCHE final key

Q514 AP EAMCET 2019 · 20 Apr · Shift 2 MCQ

If α, β, γ are the roots of the equation $x^3 - ax^2 + bx - c = 0$, then $\sum \alpha^2(\beta + \gamma) =$

(A) $ab - 3c$
(B) $\frac{ab-3c}{c}$
(C) $\frac{b^2-2ac}{c^2}$
(D) $\frac{a^2-2b}{c^2}$

Answer: (A) $ab - 3c$ · Official APSCHE final key

Q515 AP EAMCET 2019 · 20 Apr · Shift 2 MCQ

The sum of all the rational roots of the equation $6x^6 - 25x^5 + 31x^4 - 31x^2 + 25x - 6 = 0$ is

(A) 3
(B) 3.5
(C) $\frac{25}{6}$
(D) 2.5

Answer: (D) 2.5 · Official APSCHE final key

Q516 TS EAMCET 2018 · 7 May · Shift 1 MCQ

If α, β are the roots of the equation $x^2 + 5x + 2 = 0$ then $\left(\frac{\alpha}{2+5\alpha}\right)^2 + \left(\frac{\beta}{2+5\beta}\right)^2 =$

(A) $\frac{4}{21}$
(B) $\frac{19}{4}$
(C) $\frac{21}{4}$
(D) $\frac{4}{19}$

Answer: (C) $\frac{21}{4}$ · The council's preliminary key

Q517 TS EAMCET 2018 · 7 May · Shift 1 MCQ

If the roots of $x^4 - 10x^3 + 37x^2 - 60x + 36 = 0$ are $\alpha, \alpha, \beta, \beta$ $(\alpha < \beta)$, then $2\alpha + 3\beta - 2\alpha\beta =$

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

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

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Q518 TS EAMCET 2018 · 7 May · Shift 1 MCQ

The polynomial equation of degree 5 whose roots are the translates of the roots of $x^5 - 2x^4 + 3x^3 - 4x^2 + 5x - 6 = 0$ by -2 is

(A) $x^5 - 8x^4 + 27x^3 + 46x^2 + 41x + 12 = 0$
(B) $x^5 + 8x^4 + 27x^3 + 46x^2 + 41x + 12 = 0$
(C) $x^5 + 6x^4 + 28x^3 + 46x^2 + 41x + 12 = 0$
(D) $x^5 + 8x^4 + 28x^3 + 46x^2 + 41x + 12 = 0$

Answer: (B) $x^5 + 8x^4 + 27x^3 + 46x^2 + 41x + 12 = 0$ · The council's preliminary key

Q519 TS EAMCET 2018 · 5 May · Shift 1 MCQ

If $k \in \mathbb{R}$ then roots of $(x-2)(x-3) = k^2$ are always

(A) real and distinct
(B) real and equal
(C) complex numbers
(D) rational numbers

Answer: (A) real and distinct · The council's preliminary key

Q520 TS EAMCET 2018 · 5 May · Shift 1 MCQ

If $x^2 - 3ax + 14 = 0$ and $x^2 + 2ax - 16 = 0$ have a common root then $a^4 + a^2 =$

(A) 2
(B) 90
(C) 6
(D) 20

Answer: (B) 90 · The council's preliminary key

Q521 TS EAMCET 2018 · 5 May · Shift 1 MCQ

If $\alpha_1, \alpha_2, \ldots, \alpha_n$ are the roots of $x^n + px + q = 0$, then $(\alpha_n - \alpha_1)(\alpha_n - \alpha_2)\ldots(\alpha_n - \alpha_{n-1}) =$

(A) $n\alpha_n^{n-1} + q$
(B) $\alpha_1^2 + \alpha_2^2 + \ldots + \alpha_{n-1}^2$
(C) $\alpha_n^{n-1} + p$
(D) $n\alpha_n^{n-1} + p$

Answer: (D) $n\alpha_n^{n-1} + p$ · The council's preliminary key

Q522 TS EAMCET 2018 · 5 May · Shift 1 MCQ

All the roots of the equation $x^5 + 15x^4 + 94x^3 + 305x^2 + 507x + 353 = 0$ are increased by some real number k in order to eliminate the 4^{th} degree term from the equation. Now, the coefficient of x in

the transformed equation is

(A) 2
(B) 1
(C) 6
(D) 0

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

Q523 TS EAMCET 2018 · 5 May · Shift 2 MCQ

If $x^2 + 2px - 2p + 8 > 0$ for all real values of x, then the set of all possible values of p is

(A) $(2, 4)$
(B) $(-\infty, -4)$
(C) $(2, \infty)$
(D) $(-4, 2)$

Answer: (D) $(-4, 2)$ · The council's preliminary key

Q524 TS EAMCET 2018 · 5 May · Shift 2 MCQ

If the roots of the equation $(p-3)x^2 + 2(p-3)x + 2p - 5 = 0$ are real and distinct for $\alpha < p < \beta$ and $(\beta - \alpha)$ is maximum, then the extreme value of the quadratic expression $-(\alpha + \beta)x^2 + \alpha\beta x + (\alpha - \beta)$ is

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

Answer: (D) $\frac{4}{5}$ · The council's preliminary key

Q525 TS EAMCET 2018 · 5 May · Shift 2 MCQ

If the equation $x^3 - 7x^2 + 14x - 8 = 0$ is transformed to $y^3 + py - \frac{20}{27} = 0$ when its roots are diminished by k, then $p =$

(A) $\frac{8}{3}$
(B) $\frac{7}{3}$
(C) $\frac{-7}{3}$
(D) $\frac{-8}{3}$

Answer: (C) $\frac{-7}{3}$ · The council's preliminary key

Q526 TS EAMCET 2018 · 5 May · Shift 2 MCQ

If one root of the equation $x^3 - 9x^2 + 26x - 24 = 0$ is twice the other then the sum of the cubes of those two roots is

(A) 72
(B) 253
(C) 9
(D) $\frac{9}{64}$

Answer: (A) 72 · The council's preliminary key

Q527 TS EAMCET 2018 · 4 May · Shift 1 MCQ

The set of real values of x for which the inequality $|x-1| + |x+1| < 4$ always holds good is

(A) $(-2, 2)$
(B) $(-\infty, -2) \cup (2, \infty)$
(C) $(-\infty, -1] \cup [1, \infty)$
(D) $(-2, -1) \cup (1, 2)$

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

Q528 TS EAMCET 2018 · 4 May · Shift 1 MCQ

If the roots of the equation $x^2 + x + a = 0$ exceed a, then

(A) $a > 2$
(B) $a < -2$
(C) $2 < a < 3$
(D) $-2 < a < -1$

Answer: (B) $a < -2$ · Checked by our team

Q529 TS EAMCET 2018 · 4 May · Shift 1 MCQ

If the roots of the equation $\sqrt{\frac{x}{1-x}} + \sqrt{\frac{1-x}{x}} = \frac{5}{2}$ are p and q $(p > q)$ and the roots of the equation $(p+q)x^4 - pqx^2 + \frac{p}{q} = 0$ are $\alpha, \beta, \gamma, \delta$, then $(\sum \alpha)^2 - \sum \alpha\beta + \alpha\beta\gamma\delta =$

(A) 0
(B) $\frac{104}{25}$
(C) $\frac{25}{4}$
(D) $\frac{16}{5}$

Answer: (B) $\frac{104}{25}$ · The council's preliminary key

Q530 TS EAMCET 2018 · 4 May · Shift 1 MCQ

The equation $x^5 - 5x^3 + 5x^2 - 1 = 0$ has three equal roots. If α, β are the other two roots of this equation, then $\alpha + \beta + \alpha\beta =$

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

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

Q531 TS EAMCET 2018 · 4 May · Shift 2 MCQ

Let $E_1 \equiv ax^2 + bx + c$, $E_2 \equiv bx^2 + cx + a$, $E_3 \equiv cx^2 + bx + a$ and $\frac{a^2}{bc} + \frac{b^2}{ca} + \frac{c^2}{ab} = 3$. If these quadratic expressions have a common zero, then the quadratic expression having zeroes that are common to E_2 and E_3 and different from the zeroes of E_1 is

(A) $x^2 - \frac{a(b+c)}{bc}x + bc$
(B) $ax^2 + bx + c$
(C) $x^2 - b(c+a)x + ac$
(D) $x^2 - \frac{a(b+c)}{bc}x + \frac{a^2}{bc}$

Answer: (D) $x^2 - \frac{a(b+c)}{bc}x + \frac{a^2}{bc}$ · The council's preliminary key

Q532 TS EAMCET 2018 · 4 May · Shift 2 MCQ

If for any real x, $\frac{11x^2 + 12x + 6}{x^2 + 4x + 2} = y$ is such that $y < a$ or $y \geq b$ then a, b are

(A) 3, 5
(B) -5, 3
(C) -4, 5
(D) -6, 4

Answer: (B) -5, 3 · The council's preliminary key

Q533 TS EAMCET 2018 · 4 May · Shift 2 MCQ

Given that the roots of $x^3 + 3px^2 + 3qx + r = 0$ are in harmonic progression. Then

(A) $2q^3 = r(3pq - r)$
(B) $q^3 = r(3pq - r)$
(C) $q^3 = -r(3pq - r)$
(D) $q^3 = r(r + 3pq)$

Answer: (A) $2q^3 = r(3pq - r)$ · The council's preliminary key

Q534 TS EAMCET 2018 · 4 May · Shift 2 MCQ

If α, β, γ are the roots of $x^3 + px^2 + qx + r = 0$, then $\alpha^3 + \beta^3 + \gamma^3 =$

(A) $p^3 - 3pq + r$
(B) $p^2 - 2pq + r$
(C) $3pq - 3r - p^3$
(D) $3pq + 3r + p^3$

Answer: (C) $3pq - 3r - p^3$ · The council's preliminary key

Q535 AP EAMCET 2018 · 24 Apr · Shift 1 MCQ

If $f(x)$ is a polynomial function satisfying $f(x) \cdot f\left(\frac{1}{x}\right) = f(x) + f\left(\frac{1}{x}\right)$ and $f(4) = 257$, then $f(3) =$

(A) 28
(B) 65
(C) 82
(D) 244

Answer: (C) 82 · The council's preliminary key

Q536 AP EAMCET 2018 · 24 Apr · Shift 1 MCQ

If the quadratic equation $4^{\sec^2\alpha} \cdot x^2 + 2x + \left(\beta^2 - \beta + \frac{1}{2}\right) = 0$ has real roots, then the value of $\cos^2\alpha + \cos^{-1}\beta$ is

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

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

Q537 AP EAMCET 2018 · 24 Apr · Shift 1 MCQ

The sum of the non-real roots of $(p^2 + p - 3)(p^2 + p - 2) - 12 = 0$ is

(A) 1
(B) -1
(C) 6
(D) -6

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

Q538 AP EAMCET 2018 · 24 Apr · Shift 1 MCQ

The solution set of the inequation $\sqrt{x^2+6x+5} > (8-x)$ is

(A) $(8, \infty)$
(B) $\left(\frac{59}{22}, 8\right]$
(C) $\left(\frac{59}{22}, \infty\right)$
(D) $(-1, \infty)$

Answer: (C) $\left(\frac{59}{22}, \infty\right)$ · The council's preliminary key

Q539 AP EAMCET 2018 · 24 Apr · Shift 1 MCQ

If α, β are the irrational roots of the equation $x^5 - 5x^4 + 9x^3 - 9x^2 + 5x - 1 = 0$, then the roots of the equation $(\alpha+\beta)x^2 + 2\alpha\beta x - \alpha\beta = 0$ are

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

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

Q540 AP EAMCET 2018 · 24 Apr · Shift 2 MCQ

The number of distinct real solutions for the equation $\left|x^2+2x-8\right| + x - 2 = 0$ is

(A) 1
(B) 2
(C) 3
(D) 4

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

Q541 AP EAMCET 2018 · 24 Apr · Shift 2 MCQ

If the minimum value of $f(x) = x^2 + 2bx + 2c^2$ is greater than the maximum value of $g(x) = -x^2 - 2cx + b^2$ for all real x then

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(A) $|c| > \sqrt{2}|b|$
(B) $|c|\sqrt{3} > |b|$
(C) $-1 < c < \sqrt{2}\,b$
(D) $\frac{1}{\sqrt{2}} < c < |b|$

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

Q542 AP EAMCET 2018 · 24 Apr · Shift 2 MCQ

If α, β, γ are the roots of $x^3 - 2x^2 + 4x - 1 = 0$ then the equation having the roots $\beta\gamma + \frac{1}{\alpha}$, $\alpha\beta + \frac{1}{\gamma}$, $\gamma\alpha + \frac{1}{\beta}$ is

(A) $x^3 + 8x^2 - 8x + 8 = 0$
(B) $x^3 - 8x^2 + 16x - 8 = 0$
(C) $x^3 - 8x^2 + 8x - 8 = 0$
(D) $x^3 - 4x^2 + 8x - 16 = 0$

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

Q543 AP EAMCET 2018 · 23 Apr · Shift 1 MCQ

Let a, b and c be three positive real numbers such that the sum of any two of them is greater than the third. All the values of λ such that the roots of the equation $x^2 + 2(a+b+c)x + 3\lambda(ab+bc+ca) = 0$ are real, are given by

(A) $\lambda < \frac{2}{3}$
(B) $\lambda \geq \frac{2}{3}$
(C) $\lambda < \frac{4}{3}$
(D) $\frac{1}{3} < \lambda < \frac{2}{3}$

Answer: (C) $\lambda < \frac{4}{3}$ · The council's preliminary key

Q544 AP EAMCET 2018 · 23 Apr · Shift 1 MCQ

Let $f(x) = (x-a)(x-b) - \left(\frac{a+b}{2}\right)$. If $f(x) = 0$ has both non-negative roots, then the minimum value of $f(x)$

(A) $= \left(\frac{a+b}{4}\right)$
(B) $\geq \frac{(a+b)^2}{4}$
(C) $\geq \frac{-(a+b)^2}{4}$
(D) $\leq \frac{-(a+b)^2}{4}$

Answer: (C) $\geq \frac{-(a+b)^2}{4}$ · The council's preliminary key

Q545 AP EAMCET 2018 · 23 Apr · Shift 1 MCQ

If a, b and c are the roots of $x^3 + 4x + 1 = 0$, then $\frac{1}{a+b} + \frac{1}{b+c} + \frac{1}{c+a} =$

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

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

Q546 AP EAMCET 2018 · 23 Apr · Shift 1 MCQ

If the sum of any two roots of the equation $x^3 + px^2 + qx + r = 0$ is zero, then

(A) $r = pq$
(B) $pq^2 = r$
(C) $r^2 = pq$
(D) $pqr = 1$

Answer: (A) $r = pq$ · The council's preliminary key

Q547 AP EAMCET 2018 · 23 Apr · Shift 2 MCQ

If the quadratic equation formed by eliminating x from $x^2 + \alpha x + \beta = 0$ and $xy + l(x + y) + m = 0$ has the same roots as that of the given quadratic equation, then the set of values of β is

(A) $\{m,\ \alpha l - m\}$
(B) $\{m,\ l + m\}$
(C) $\{m,\ \alpha l + m\}$
(D) $\{m,\ l - m\}$

Answer: (A) $\{m,\ \alpha l - m\}$ · The council's preliminary key

Q548 AP EAMCET 2018 · 23 Apr · Shift 2 MCQ

If the equation whose roots are p times the roots of $x^4 - 2ax^3 + 4bx^2 + 8ax + 16 = 0$ is a reciprocal equation, then $|p| =$

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

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

Q549 AP EAMCET 2018 · 22 Apr · Shift 1 MCQ

The number of integral values of x satisfying $5x - 1 < (x + 1)^2 < 7x - 3$ is

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

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

Q550 AP EAMCET 2018 · 22 Apr · Shift 1 MCQ

For real number x, if the minimum value of $f(x) = x^2 + 2bx + 2c^2$ is greater than the maximum value of $g(x) = -x^2 - 2cx + b^2$, then

(A) $c^2 > 2b^2$
(B) $c^2 < 2b^2$
(C) $b^2 = 2c^2$
(D) $c^2 = 2b^2$

Answer: (A) $c^2 > 2b^2$ · The council's preliminary key

Q551 AP EAMCET 2018 · 22 Apr · Shift 1 MCQ

If a, b and c are the roots of $x^3 + qx + r = 0$, then $(a-b)^2 + (b-c)^2 + (c-a)^2 =$

(A) $-6q$
(B) $-4q$
(C) $6q$
(D) $4q$

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

Q552 AP EAMCET 2018 · 22 Apr · Shift 1 MCQ

If the sum of two roots of the equation $x^3 - 2px^2 + 3qx - 4r = 0$ is zero, then the value of r is

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

Answer: (A) $\frac{3pq}{2}$ · The council's preliminary key

Q553 AP EAMCET 2018 · 22 Apr · Shift 2 MCQ

If $z \in C$ and $iz^3 + 4z^2 - z + 4i = 0$, then a complex root of this equation having minimum magnitude is

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

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

Q554 AP EAMCET 2018 · 22 Apr · Shift 2 MCQ

If α, β are the roots of the equation $x^2 - 4x + 5 = 0$, then the quadratic equation whose roots are $\alpha^2 + \beta$ and $\alpha + \beta^2$ is

(A) $x^2 + 10x + 34 = 0$
(B) $x^2 - 10x + 34 = 0$
(C) $x^2 - 10x - 34 = 0$
(D) $x^2 + 10x - 34 = 0$

Answer: (B) $x^2 - 10x + 34 = 0$ · The council's preliminary key

Q555 AP EAMCET 2018 · 22 Apr · Shift 2 MCQ

$f(x)$ is a quadratic expression such that $f(x)$ is negative when $x \in \left(-\infty, -\frac{5}{3}\right) \cup (3, \infty)$ and positive when $x \in \left(-\frac{5}{3}, 3\right)$. $g(x)$ is another quadratic expression such that $g(x)$ is negative when $x \in \left(3, \frac{9}{2}\right)$ and positive when $x \in \mathbb{R} - \left[3, \frac{9}{2}\right]$. Then the sign of $f(x)g(x)$ in $[0, 5]$ is

(A) Positive in $\left[0, \frac{9}{2}\right]$ and negative in $\left(\frac{9}{2}, 5\right)$
(B) Positive in $[0, 3) \cup \left(3, \frac{9}{2}\right)$ and negative in $\left(\frac{9}{2}, 5\right]$
(C) Positive in $[0, 3) \cup \left(3, \frac{9}{2}\right) \cup \left(\frac{9}{2}, 5\right]$
(D) Negative in $[0, 3) \cup \left(3, \frac{9}{2}\right) \cup \left(\frac{9}{2}, 5\right]$

Answer: (B) Positive in $[0, 3) \cup \left(3, \frac{9}{2}\right)$ **and negative in** $\left(\frac{9}{2}, 5\right]$ · The council's preliminary key

Q556 AP EAMCET 2018 · 22 Apr · Shift 2 MCQ

If $a, b, c \in \mathbb{R}$ be such that $4a + 2b + c > 0$ and $ax^2 + bx + c = 0$ has no real roots, then the value of $(c + a)(c + b)$ is

(A) greater than ab
(B) less than bc
(C) greater than ca
(D) less than $ab + bc + ca$

Answer: (A) greater than ab · The council's preliminary key

Q557 AP EAMCET 2018 · 22 Apr · Shift 2 MCQ

The minimum degree of a polynomial equation with rational coefficients having $\sqrt{3}+\sqrt{27}, \sqrt{2}+5i$ as two of its roots is

(A) 8
(B) 6
(C) 4
(D) 2

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

Q558 TS EAMCET 2017 · 12 May · Offline MCQ

Let $f(x)$ be a quadratic expression such that $f(0)+f(1)=0$. If $f(-2)=0$, then

(A) $f\left(\frac{-2}{5}\right)=0$
(B) $f\left(\frac{2}{5}\right)=0$
(C) $f\left(\frac{-3}{5}\right)=0$
(D) $f\left(\frac{3}{5}\right)=0$

Answer: (D) $f\left(\frac{3}{5}\right)=0$ · The council's preliminary key

Q559 TS EAMCET 2017 · 12 May · Offline MCQ

The product of all the real roots of $x^2-8x+9-\frac{8}{x}+\frac{1}{x^2}=0$ is

(A) 2
(B) 1
(C) 3
(D) 7

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

Q560 TS EAMCET 2017 · 12 May · Offline MCQ

α and β are the roots of $x^2+2x+C=0$. If $\alpha^3+\beta^3=4$, then the value of C is

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

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

Q561 TS EAMCET 2017 · 12 May · Offline MCQ

If α and β are the roots of the equation $ax^2+bx+c=0$ and the equation having roots $\frac{1-\alpha}{\alpha}$ and $\frac{1-\beta}{\beta}$ is $px^2+qx+r=0$, then $r=$

(A) $a+2b$
(B) $ab+bc+ca$
(C) $a+b+c$
(D) abc

Answer: (C) $a+b+c$ · The council's preliminary key

Q562 AP EAMCET 2017 · 26 Apr · Shift 1 MCQ

$\frac{x-1}{3x+4}<\frac{x-3}{3x-2}$ holds, for all x in the interval

(A) $\left(-\infty,\frac{-5}{4}\right)$
(B) $\left(\frac{-4}{3},\frac{2}{3}\right)$
(C) $\left(\frac{3}{4},\infty\right)$
(D) $\left(-\infty,\frac{-5}{4}\right)\cup\left(\frac{3}{4},-\infty\right)$ (sic)

Answer: (B) $\left(\frac{-4}{3},\frac{2}{3}\right)$ · The council's preliminary key

Q563 AP EAMCET 2017 · 26 Apr · Shift 1 MCQ

If the roots of the equation $x^3-7x^2+14x-8=0$ are in a geometric progression, then the difference between the largest and the smallest roots is

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

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

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Q564 AP EAMCET 2017 · 26 Apr · Shift 1 MCQ

If α, β, γ are the roots of $x^3 + px^2 + qx + r = 0$, then the value of $(1+\alpha^2)(1+\beta^2)(1+\gamma^2)$ is

(A) $(r+p)^2 + (q+1)^2$
(B) $(r-p)^2 + (q-1)^2$
(C) $(1+p)^2 + (1+q)^2$
(D) $(r-p)^2 + (r-q)^2$

Answer: (B) $(r-p)^2 + (q-1)^2$ · The council's preliminary key

Q565 AP EAMCET 2017 · 26 Apr · Shift 2 MCQ

For a non real root z of the equation $z^4 + z^2 + 1 = 0$, the value of $\left(z + \frac{1}{z}\right)^3 + \left(z^2 + \frac{1}{z^2}\right)^2 + \left(z^3 + \frac{1}{z^3}\right)^3$ is

(A) -6
(B) 3
(C) -8
(D) 8

Options (1) or (4) were accepted. More than one answer was accepted. · Checked by our team

Q566 AP EAMCET 2017 · 26 Apr · Shift 2 MCQ

Match the following
Quadratic expression / The minimum value
i) $x^2 - 8x + 15$
ii) $x^2 - 8x + 17$
iii) $2x^2 + 4x + 7$
iv) $\left(x + \frac{5}{3}\right)^2 + \frac{7}{2}$
a) $\frac{7}{2}$
b) -1
c) 1
d) 5

(A) i)→c, ii)→b, iii)→d, iv)→a
(B) i)→a, ii)→c, iii)→d, iv)→b
(C) i)→b, ii)→d, iii)→c, iv)→a
(D) i)→b, ii)→c, iii)→d, iv)→a

Answer: (D) i)→b, ii)→c, iii)→d, iv)→a · The council's preliminary key

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Q567 AP EAMCET 2017 · 26 Apr · Shift 2 MCQ

If $f:[1,2]\to\mathbb{R}$ defined by $f(x)=x^2+2kx+k$ is always negative then the interval in which k lies is

(A) $\left(\frac{4}{5},\infty\right)$

(B) $\left(-\infty,-\frac{4}{5}\right)$

(C) $\left(-\infty,\frac{4}{5}\right)$

(D) $\left(-\frac{4}{5},\infty\right)$

Answer: (B) $\left(-\infty,-\frac{4}{5}\right)$ · The council's preliminary key

Q568 AP EAMCET 2017 · 26 Apr · Shift 2 MCQ

If one root of $x^3-7x^2+36=0$ is twice the other, then the sum of those two roots is

(A) 6

(B) 9

(C) -9

(D) 12

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

Q569 AP EAMCET 2017 · 26 Apr · Shift 2 MCQ

If the roots of the equation $x^3+3px^2+3qx-8=0$ are in an arithmetic progression then $2p^3-3pq=$

(A) 8

(B) -8

(C) 4

(D) -4

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

Q570 AP EAMCET 2017 · 26 Apr · Shift 2 MCQ

The value of k for which the equation $x^2-3x+k=0$ has at least one real root in $[0,1]$ is

(A) $\frac{5}{2}$
(B) $\frac{7}{6}$
(C) 3
(D) $\frac{20}{7}$

Answer: (B) $\frac{7}{6}$ · The council's preliminary key

Q571 AP EAMCET 2017 · 25 Apr · Shift 1 MCQ

The set of values of $x \in \mathbb{R}$ satisfying the inequality $x^2 - 4x - 21 \leq 0$ is

(A) $[3, 7]$
(B) $[-3, 7]$
(C) $[-7, 3]$
(D) $[-7, -3]$

Answer: (B) $[-3, 7]$ · The council's preliminary key

Q572 AP EAMCET 2017 · 25 Apr · Shift 1 MCQ

The values of x for which the inequality $\frac{8x^2+16x-51}{(2x-3)(x+4)} > 3$ holds, are

(A) $x \geq 4$
(B) $-4 \leq x \leq -3$
(C) $\frac{3}{2} < x < \frac{5}{2}$
(D) $x < -4$ or $x > \frac{5}{2}$ or $-3 < x < \frac{3}{2}$

Answer: (D) $x < -4$ or $x > \frac{5}{2}$ or $-3 < x < \frac{3}{2}$ · The council's preliminary key

Q573 AP EAMCET 2017 · 25 Apr · Shift 1 MCQ

The difference of the irrational roots of the equation $x^5 - 5x^4 + 9x^3 - 9x^2 + 5x - 1 = 0$

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

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

Q574 AP EAMCET 2017 · 25 Apr · Shift 1 MCQ

For $k > 0$, if $k\sqrt{-1}$ is a root of the equation $x^4 + 6x^3 - 16x^2 + 24x - 80 = 0$ then $k^2 =$

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(A) 2
(B) 3
(C) 4
(D) 6

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

Q575 AP EAMCET 2017 · 25 Apr · Shift 2 MCQ

The integral value of k for which $x^2 - 2(4k-1)x + 15k^2 - 2k - 7 > 0$ for all $x \in \mathbb{R}$ is

(A) 2
(B) 3
(C) 1
(D) 4

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

Q576 AP EAMCET 2017 · 25 Apr · Shift 2 MCQ

If x_1, x_3 are the roots of $Ax^2 - 4x + 1 = 0$ and x_2, x_4 are the roots of $Bx^2 - 6x + 1 = 0$ such that x_1, x_2, x_3, x_4 are in harmonic progression, then $\frac{B+A}{B-A} =$

(A) $\frac{11}{5}$
(B) $\frac{-11}{5}$
(C) $\frac{5}{11}$
(D) $\frac{-5}{11}$

Answer: (A) $\frac{11}{5}$ · The council's preliminary key

Q577 AP EAMCET 2017 · 25 Apr · Shift 2 MCQ

If α and β are the roots of $ax^2 + bx + c = 0$, then the roots of $ax^2 - bx(x-1) + c(x-1)^2 = 0$ are

(A) $\frac{\alpha+1}{\alpha}, \frac{\beta+1}{\beta}$
(B) $\frac{\alpha}{\alpha+1}, \frac{\beta}{\beta+1}$
(C) $\frac{\alpha}{\beta}, \frac{\beta}{\alpha}$
(D) $\frac{\alpha-1}{\alpha+1}, \frac{\beta-1}{\beta+1}$

Answer: (B) $\frac{\alpha}{\alpha+1}, \frac{\beta}{\beta+1}$ · The council's preliminary key

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Q578 AP EAMCET 2017 · 25 Apr · Shift 2 MCQ

If the roots of the equation $x^5 - 40x^4 - Px^3 - Rx - S = 0$ are in geometric progression and the sum of the reciprocals of the roots is 10, then $|S| =$

(A) 8
(B) 16
(C) 32
(D) 64

Answer: (C) 32 · The council's preliminary key

Q579 AP EAMCET 2017 · 24 Apr · Shift 1 MCQ

The number of integral solutions of $2\left(x^2 + \frac{1}{x^2}\right) - 7\left(x + \frac{1}{x}\right) + 9 = 0$ when $x \neq 0$ is

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

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

Q580 AP EAMCET 2017 · 24 Apr · Shift 1 MCQ

If $\left|\frac{x^2+kx+1}{x^2+x+1}\right| < 3$ for all real x, then k is in the interval

(A) $(-\infty, -1)$
(B) $(-1, 6)$
(C) $(-1, 5)$
(D) $(6, \infty)$

Answer: (C) $(-1, 5)$ · The council's preliminary key

Q581 AP EAMCET 2017 · 24 Apr · Shift 1 MCQ

If α, β, γ are the roots of the equation $x^3 - 6x^2 + 11x + 6 = 0$, then $\sum \alpha^2\beta + \sum \alpha\beta^2 =$

(A) 72
(B) 84
(C) 90
(D) 96

Answer: (B) 84 · The council's preliminary key

Q582 AP EAMCET 2017 · 24 Apr · Shift 1 MCQ

If the roots of the equation $x^3 + 3px^2 + 3qx - 8 = 0$ are in a geometric progression then $\frac{q^3}{p^3} =$

(A) 1
(B) -2
(C) 4
(D) -8

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

Q583 AP EAMCET 2017 · 24 Apr · Shift 2 MCQ

The solution set contained in $\mathbb{R}^+$ of the inequation $3^x + 3^{1-x} - 4 < 0$ is

(A) $(1, 3)$
(B) $(0, 1)$
(C) $(0, 1]$
(D) $(0, 2)$

Answer: (B) $(0, 1)$ · The council's preliminary key

Q584 AP EAMCET 2017 · 24 Apr · Shift 2 MCQ

The maximum value of the expression $\frac{x^2 + x + 1}{2x^2 - x + 1}$, for $x \in \mathbb{R}$, is

(A) $\frac{7 + 2\sqrt{7}}{7}$
(B) $\frac{7 - 2\sqrt{7}}{7}$
(C) $\frac{7}{3}$
(D) $\frac{14 + 2\sqrt{7}}{7}$

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

Q585 AP EAMCET 2017 · 24 Apr · Shift 2 MCQ

If the equation $x^5 - 3x^4 - 5x^3 + 27x^2 - 32x + 12 = 0$ has repeated roots, then the prime number that divides the non-repeated root of this equation is

(A) 7
(B) 5
(C) 3
(D) 2

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

Q586 AP EAMCET 2017 · 24 Apr · Shift 2 MCQ

If α, β are the roots of $x^2 - 3x + a = 0$ and γ, δ are the roots of $x^2 - 12x + b = 0$ and $\alpha, \beta, \gamma, \delta$ in that order form a geometric progression in increasing order with common ratio $r > 1$, then $a + b =$

(A) 16
(B) 28
(C) 34
(D) 42

Answer: (C) 34 · The council's preliminary key

Q587 TS EAMCET 2016 · 15 May · Offline MCQ

The number of real roots of $|x|^2 - 5|x| + 6 = 0$ is

(A) 2
(B) 3
(C) 4
(D) 1

Answer: (C) 4 · Official TGCHE final key

Q588 TS EAMCET 2016 · 15 May · Offline MCQ

If α, β, γ are roots of $x^3 - 5x + 4 = 0$ then $(\alpha^3 + \beta^3 + \gamma^3)^2 =$

(A) 12
(B) 13
(C) 169
(D) 144

Answer: (D) 144 · Official TGCHE final key

Q589 TS EAMCET 2016 · 15 May · Offline MCQ

Suppose α, β, γ are roots of $x^3 + x^2 + 2x + 3 = 0$. If $f(x) = 0$ is a cubic polynomial equation whose roots are $\alpha + \beta, \beta + \gamma, \gamma + \alpha$ then $f(x) =$

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

Answer: (C) $x^3 + 2x^2 + 3x - 1$ · Official TGCHE final key

Q590 AP EAMCET 2016 · 29 Apr · Offline MCQ

If $12^{4+2x^2} = (24\sqrt{3})^{3x^2-2}$, then $x =$

(A) $\pm\sqrt{\frac{13}{12}}$

(B) $\pm\sqrt{\frac{14}{5}}$

(C) $\pm\sqrt{\frac{12}{13}}$

(D) $\pm\sqrt{\frac{5}{14}}$

Answer: (B) $\pm\sqrt{\frac{14}{5}}$ · The council's preliminary key

Q591 AP EAMCET 2016 · 29 Apr · Offline MCQ

The product and sum of the roots of the equation $|x^2| - 5|x| - 24 = 0$ are respectively

(A) $-64, 0$

(B) $-24, 5$

(C) $5, -24$

(D) $0, 72$

Answer: (A) $-64, 0$ · The council's preliminary key

Q592 AP EAMCET 2016 · 29 Apr · Offline MCQ

The number of real roots of the equation $x^5 + 3x^3 + 4x + 30 = 0$ is

(A) 1

(B) 2

(C) 3

(D) 5

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

Q593 AP EAMCET 2016 · 29 Apr · Offline MCQ

If the coefficients of the equation whose roots are k times the roots of the equation $x^3 + \frac{1}{4}x^2 - \frac{1}{16}x + \frac{1}{144} = 0$, are integers then a possible value of k is

(A) 3

(B) 12

(C) 9

(D) 4

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

Q594 AP EAMCET 2016 · 29 Apr · Offline MCQ

If $x = a$ is a root of multiplicity two of a polynomial equation $f(x) = 0$, then

(A) $f'(a) = f''(a) = 0$
(B) $f''(a) = f(a) = 0$
(C) $f'(a) \neq 0 \neq f''(a)$
(D) $f(a) = f'(a) = 0;\ f''(a) \neq 0$

Answer: (D) $f(a) = f'(a) = 0;\ f''(a) \neq 0$ · The council's preliminary key

Q595 AP EAMCET 2014 · 22 May · Offline MCQ

If x_1 and x_2 are the real roots of the equation $x^2 - kx + c = 0$ then the distance between the points $A(x_1, 0)$ and $B(x_2, 0)$ is

(A) $\sqrt{k^2 + 4c}$
(B) $\sqrt{k^2 - c}$
(C) $\sqrt{c - k^2}$
(D) $\sqrt{k^2 - 4c}$

Answer: (D) $\sqrt{k^2 - 4c}$ · The council's preliminary key

Q596 AP EAMCET 2014 · 22 May · Offline MCQ

If x is real, then the minimum value of $y = \frac{x^2 - x + 1}{x^2 + x + 1}$ is

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

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

Q597 AP EAMCET 2014 · 22 May · Offline MCQ

If p and q are distinct prime numbers and if the equation $x^2 - px + q = 0$ has positive integers as its roots then the roots of the equation are

(A) $1, -1$
(B) $2, 3$
(C) $1, 2$
(D) $3, 1$

Answer: (C) $1, 2$ · The council's preliminary key

Q598 AP EAMCET 2014 · 22 May · Offline MCQ

The cubic equation whose roots are the squares of the roots of $x^3 - 2x^2 + 10x - 8 = 0$ is

(A) $x^3 + 16x^2 + 68x - 64 = 0$
(B) $x^3 + 8x^2 + 68x - 64 = 0$
(C) $x^3 + 16x^2 - 68x - 64 = 0$
(D) $x^3 - 16x^2 + 68x - 64 = 0$

Answer: (A) $x^3 + 16x^2 + 68x - 64 = 0$ · The council's preliminary key

Q599 AP EAMCET 2013 · 10 May · Offline MCQ

If the harmonic mean between the roots of $(5+\sqrt{2})x^2 - bx + (8+2\sqrt{5}) = 0$ is 4, then the value of b

(A) 2
(B) 3
(C) $4 - \sqrt{5}$
(D) $4 + \sqrt{5}$

Answer: (D) $4 + \sqrt{5}$ · The council's preliminary key

Q600 AP EAMCET 2013 · 10 May · Offline MCQ

The set of solutions satisfying both $x^2 + 5x + 6 \geq 0$ and $x^2 + 3x - 4 < 0$ is

(A) $(-4, 1)$
(B) $(-4, -3] \cup [-2, 1)$
(C) $(-4, -3) \cup (-2, 1)$
(D) $[-4, -3] \cup [-2, 1]$

Answer: (B) $(-4, -3] \cup [-2, 1)$ · The council's preliminary key

Q601 AP EAMCET 2013 · 10 May · Offline MCQ

If the roots of $x^3 - 42x^2 + 336x - 512 = 0$, are in increasing geometric progression, then its common ratio is

(A) 2
(B) 3
(C) 4
(D) 6

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

Q602 AP EAMCET 2012 · 12 May · Offline MCQ

The product of real roots of the equation $|x|^{6/5} - 26|x|^{3/5} - 27 = 0$ is

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(A) -3^{10}
(B) -3^{12}
(C) $-3^{12/5}$
(D) $-3^{21/5}$

Answer: (A) -3^{10} · Official APSCHE final key

Q603 AP EAMCET 2012 · 12 May · Offline MCQ

If α, β, γ are the roots of the equation $x^3 + px^2 + qx + r = 0$ then the coefficient of x in the cubic equation whose roots are $\alpha(\beta + \gamma),\ \beta(\gamma + \alpha)$ and $\gamma(\alpha + \beta)$ is

(A) $2q$
(B) $q^2 + pr$
(C) $p^2 - qr$
(D) $r(pq - r)$

Answer: (B) $q^2 + pr$ · Official APSCHE final key

Q604 AP EAMCET 2012 · 12 May · Offline MCQ

Let $A = \begin{vmatrix} 2 & e^{i\pi} \\ i^2 & i^{2012} \end{vmatrix}$, $C = \frac{d}{dx}\left(\frac{1}{x}\right)\Big|_{x=1}$ and $D = \int_{e^2}^{1} \frac{dx}{x}$. If the sum of two roots of the equation $Ax^3 + Bx^2 + Cx + D = 0$ is equal to zero, then B =

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

Answer: (D) 2 · Official APSCHE final key

Q605 AP EAMCET 2012 · 12 May · Offline MCQ

If a, b, c form a geometric progression with common ratio r, then the sum of the ordinates of the points of intersection of the line $ax + by + c = 0$ and the curve $x + 2y^2 = 0$ is

(A) $-\frac{r^2}{2}$
(B) $-\frac{r}{2}$
(C) $\frac{r}{2}$
(D) r

Answer: (C) $\frac{r}{2}$ · Official APSCHE final key

Q606 AP EAMCET 2011 · 8 May · Offline MCQ

If $a > 0$ and $b^2 - 4ac = 0$, then the curve $y = ax^2 + bx + c$

(A) cuts the x-axis
(B) touches the x-axis and lies below it
(C) lies entirely above the x-axis
(D) touches the x-axis and lies above it

Answer: (D) touches the x-axis and lies above it · The council's preliminary key

Q607 AP EAMCET 2011 · 8 May · Offline MCQ

If $\tan A$ and $\tan B$ are the roots of the quadratic equation $x^2 - px + q = 0$, then $\sin^2(A+B) =$

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

Answer: (D) $\frac{p^2}{p^2+(1-q)^2}$ · The council's preliminary key

Q608 AP EAMCET 2011 · 8 May · Offline MCQ

The value of 'a' for which the equations $x^3 + ax + 1 = 0$ and $x^4 + ax^2 + 1 = 0$ have a common root is

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

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

Q609 AP EAMCET 2011 · 8 May · Offline MCQ

If x is real, then the value of $\dfrac{x^2 - 3x + 4}{x^2 + 3x + 4}$ lies in the interval

(A) $\left[\frac{1}{3}, 3\right]$
(B) $\left[\frac{1}{5}, 5\right]$
(C) $\left[\frac{1}{6}, 6\right]$
(D) $\left[\frac{1}{7}, 7\right]$

Answer: (D) $\left[\frac{1}{7}, 7\right]$ · The council's preliminary key

Q610 AP EAMCET 2010 · 30 May · Offline MCQ

For $x \in \mathbb{R}$, the least value of $\dfrac{x^2 - 6x + 5}{x^2 + 2x + 1}$ is :

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(A) -1
(B) $-\frac{1}{2}$
(C) $-\frac{1}{4}$
(D) $-\frac{1}{3}$

Answer: (D) $-\frac{1}{3}$ · Official APSCHE final key

Q611 AP EAMCET 2010 · 30 May · Offline MCQ

$\left\{x \in \mathbb{R} : \frac{14x}{x+1} - \frac{9x-30}{x-4} < 0\right\} =$

(A) $(-1, 4)$
(B) $(1, 4) \cup (5, 7)$
(C) $(1, 7)$
(D) $(-1, 1) \cup (4, 6)$

Answer: (D) $(-1, 1) \cup (4, 6)$ · Official APSCHE final key

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Q612 AP EAMCET 2010 · 30 May · Offline MCQ

The condition that the roots of $x^3 - bx^2 + cx - d = 0$ are in geometric progression is :

(A) $c^3 = b^3 d$
(B) $c^2 = b^2 d$
(C) $c = bd^3$
(D) $c = bd^2$

Answer: (A) $c^3 = b^3 d$ · Official APSCHE final key

Q613 AP EAMCET 2010 · 30 May · Offline MCQ

Let $\alpha \neq 1$ be a real root of the equation $x^3 - ax^2 + ax - 1 = 0$, where $a \neq -1$ is a real number. Then a root of this equation, among the following, is :

(A) α^2
(B) $-\frac{1}{\alpha}$
(C) $\frac{1}{\alpha}$
(D) $-\frac{1}{\alpha^2}$

Answer: (C) $\frac{1}{\alpha}$ · Official APSCHE final key

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Q614 AP EAMCET 2010 · 30 May · Offline MCQ

If α, β, γ are the roots of the equation $x^3 - 6x^2 + 11x - 6 = 0$ and if $a = \alpha^2 + \beta^2 + \gamma^2$, $b = \alpha\beta + \beta\gamma + \gamma\alpha$ and $c = (\alpha + \beta)(\beta + \gamma)(\gamma + \alpha)$, then the correct inequality among the following is :

(A) $a < b < c$

(B) $b < a < c$

(C) $b < c < a$

(D) $c < a < b$

Answer: (B) $b < a < c$ · Official APSCHE final key

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