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MATHEMATICS · EAPCET (EAMCET)

Applications of Derivatives

Previous Year Questions with answers

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

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

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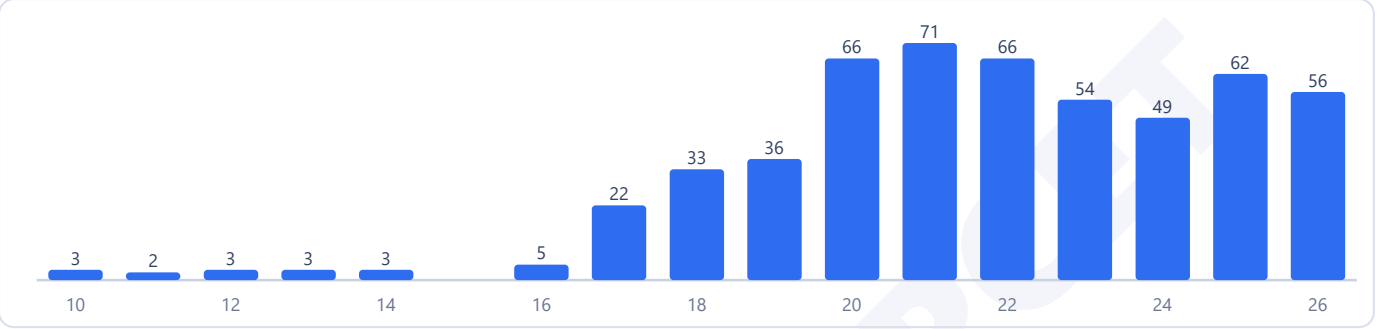
Chapter at a glance

4.7%	534	77 of 77	534 / 0
of Mathematics questions, 2022–2026	questions, 2010–2026	papers asked it, 2022–2026	MCQ / numerical, 2010–2026

Trend. Steady: 3.6 questions per paper in 2024–2026 against 3.9 in 2022–2023.

Questions per year



Counts are the questions we hold: 534 in 149 papers. 6 questions in this chapter came back in more than one paper.

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

Tangents & Normals	203
Maxima & Minima	147
Rate of Change	126
Monotonicity	58

How often it comes up

Applications of Derivatives stands as an immense calculus powerhouse that features prominently across every single examination sitting. Over the complete testing archive spanning 2010 through 2026, the chapter delivered 534 questions across 149 evaluated exam papers, appearing in all 149 sittings to maintain an average of 3.6 questions per paper and a 4.5 percent subject share. In contemporary testing from 2022 to 2026, Applications of Derivatives preserved this perfect appearance in every paper, supplying 287 questions across 77 sittings (recording an average of 3.7 questions per paper and a 4.7 percent subject share). This commanding volume establishes the unit at rank 8 of 29 mathematics chapters.

Every recent exam session features between three and four applied calculus problems. Across the three most recent testing years from 2024 to 2026, candidates answered 167 questions across 46 sittings (present in all 46 papers, averaging 3.6 questions per test and a 4.5 percent share). In the preceding testing span from 2010 through 2021, the chapter provided 247 questions across 72 sittings (appearing in all 72 papers, 3.4 per test, 4.3 percent share). Evaluating temporal 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 individual state boards between 2022 and 2026, Andhra Pradesh sittings contributed 178 questions across 48 papers (all 48 papers, 3.7 per test, 4.6 percent share), while Telangana sittings contributed 109 questions across 29 papers (all 29 papers, 3.8 per test, 4.7 percent share).

Most-asked topics

Questions distribute across four distinct physical and geometric applications:

- **Tangents & Normals**: Accounting for 203 total questions, with 116 emerging in modern sessions (tested through 2026). Coverage encompasses slope of tangents and normals, equations of tangent lines, lengths of tangent,

normal, subtangent, and subnormal segments, angle between intersecting curves, and orthogonality conditions.

- **Maxima & Minima**: Supplying 147 total questions, with 77 set in recent examinations (tested through 2026). Key concepts include local extrema via first and second derivative tests, global extrema on closed intervals, critical points, inflection points, and geometric optimization of areas and volumes.
- **Rate of Change**: Delivering 126 total questions, with 59 appearing in recent cycles (tested through 2026). Problems explore related rates (expanding spheres, draining conical tanks, sliding ladders), velocity and acceleration, and linear approximations using differentials.
- **Monotonicity**: Comprising 58 total questions, with 35 set in the recent era (tested up to 2026). Focus areas involve strictly increasing and strictly decreasing intervals, proving algebraic inequalities via derivative signs, and stationary points.

What the questions look like

Examiners test geometric lengths on Cartesian axes, curve intersections, and constrained optimization.

A recurring question template asks for relationships among geometric lengths associated with a curve: length of tangent (modulus of y times square root of one plus m squared divided by m), length of normal (modulus of y times square root of one plus m squared), subtangent (modulus of y divided by m), and subnormal (modulus of y times m). Another frequent problem requires finding the angle of intersection between two standard conic curves, such as parabolas, by evaluating their derivatives at their common intersection points. Optimization questions frequently present product functions like x to the power alpha times a minus x to the power beta, asking for parameter ratios that place the global maximum at a specified coordinate.

How to practise it

Memorize the formulas for geometric segment lengths: with m denoting dy over dx at point (x, y), length of subtangent equals absolute value of y over m, length of subnormal equals absolute value of y times m, length of tangent equals absolute value of y over m times square root of one plus m squared, and length of normal equals absolute value of y times square root of one plus m squared. Notice that for the standard parabola y squared equals four a x, the subnormal is constant and equals two a.

To find the angle theta between two intersecting curves, find their intersection points, compute slopes m one and m two at those points, and use tan theta equals absolute value of m one minus m two divided by one plus m one times m two. Two curves intersect orthogonally if m one times m two equals negative one. For optimization problems, formulate the objective function in terms of a single variable, locate critical points where the first derivative vanishes, and verify local extrema using the second derivative test.

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Q1 AP EAPCET 2026 · 18 May · Shift 1 MCQ

The maximum volume (in cu. m) of the right circular cone having slant height 3m. is

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

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

Q2 AP EAPCET 2026 · 18 May · Shift 1 MCQ

At any point on the curve $by^2 = (x+a)^3$, if the length of the subtangent (ST) and the length of the sub normal (SN) are such that $p(\mathrm{SN}) = q(\mathrm{ST})^2$, then $\frac{p}{q} =$

(A) $\frac{2b}{9}$
(B) $\frac{8b}{27}$
(C) $\frac{5b}{8}$
(D) $\frac{27}{8b}$

Answer: (B) $\frac{8b}{27}$ · The council's preliminary key

Q3 AP EAPCET 2026 · 18 May · Shift 2 MCQ

If a sector of maximum area is made with a wire of length 40 cm , then the area (in $sq\ cms$) of that sector is

(A) 50
(B) 100
(C) 25
(D) 200

Answer: (B) 100 · The council's preliminary key

Q4 AP EAPCET 2026 · 18 May · Shift 2 MCQ

If the rate of increase in the surface area of a cube is $6\ sq.cm./sec$, then the rate of increase in its volume (in $c.c./sec$), when the length of its edge is $12\ cm$, is

(A) 6
(B) 12
(C) 18
(D) 9

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

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Q5 AP EAPCET 2026 · 18 May · Shift 2 MCQ

Approximate value of $\sqrt[3]{345}$, when it is calculated with the application of derivatives, is

(A) 7.013
(B) 7.025
(C) 7.001
(D) 7.003

Answer: (A) 7.013 · The council's preliminary key

Q6 AP EAPCET 2026 · 18 May · Shift 2 MCQ

The length of the normal drawn to the curve $2x^3 + 2y^3 = 9xy$ at the point $(2, 1)$, is

(A) $\frac{\sqrt{41}}{4}$
(B) $\frac{2}{3}\sqrt{41}$
(C) $\sqrt{5}$
(D) $\frac{2}{3}\sqrt{5}$

Answer: (A) $\frac{\sqrt{41}}{4}$ · The council's preliminary key

Q7 AP EAPCET 2026 · 15 May · Shift 1 MCQ

If $f(x) = ax^3 + bx^2 + cx + 1$ attains an extreme value 2 at $x = 1$ and another extreme value at $x = \frac{2}{3}$, then $2b + 3c =$

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

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

Q8 AP EAPCET 2026 · 15 May · Shift 1 MCQ

If a cylindrical tank of radius 3 m is filled with water at the rate of $\frac{3}{2}$ m^3/sec, then the rate of change of its water level in (m/sec) is

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

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

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Q9 AP EAPCET 2026 · 15 May · Shift 1 MCQ

The surface area of a cube is 150 sq. cm. If it is increased by 0.025 sq. cm, then the approximate increase in its volume (in c.c.) is

(A) 0.0725
(B) 0.04
(C) 0.032
(D) 0.03125

Answer: (D) 0.03125 · The council's preliminary key

Q10 AP EAPCET 2026 · 15 May · Shift 1 MCQ

The length of the tangent drawn at the point $P(1, 3\sqrt{3})$ on the curve $x^{2/3} + y^{2/3} = 4$ is

(A) 4
(B) 6
(C) 12
(D) 8

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

Q11 AP EAPCET 2026 · 15 May · Shift 2 MCQ

If the displacement of a particle at time t $(0 < t < \pi)$ is given by $s = 3\sin 2t - 6\cos t$, then the acceleration for the values of t at which its velocity is zero is

(A) 0 units / sec^2
(B) 2 units / sec^2
(C) 3 units / sec^2
(D) 4 units / sec^2

Answer: (A) 0 units / sec^2 · The council's preliminary key

Q12 AP EAPCET 2026 · 15 May · Shift 2 MCQ

If $f(x) = \sqrt{3}\sin x - \cos x - 2ax + b$ decreases for all $x \in R$, then

(A) $a \leq 1$
(B) $a \geq 1$
(C) $a \leq \frac{1}{2}$
(D) $a \geq \frac{1}{2}$

Answer: (B) $a \geq 1$ · The council's preliminary key

Q13 AP EAPCET 2026 · 15 May · Shift 2 MCQ

The maximum area of the rectangle that can be inscribed in a circle of radius r is

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

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

Q14 AP EAPCET 2026 · 15 May · Shift 2 MCQ

The maximum value of $y = x(\log x)^2$ is

(A) e^{-2}
(B) $2e^{-2}$
(C) $4e^{-2}$
(D) $5e^{-2}$

Answer: (C) $4e^{-2}$ · The council's preliminary key

Q15 AP EAPCET 2026 · 14 May · Shift 1 MCQ

If the vertical angle of a cone is 60° and the rate of change of its total surface area is $2\sqrt{3}\ cm^2/sec$, then the rate of change of its volume $(in\ cm^3/sec)$ when its radius is $5cm$, is

(A) 15
(B) 10
(C) 5
(D) 9

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

Q16 AP EAPCET 2026 · 14 May · Shift 1 MCQ

The surface area of a sphere is $49\pi\ sq.cm$. If it is increased by $0.016\ sq.cm$, then the approximate increase in its volume $(in\ c.c.)$ is

(A) 0.07
(B) 0.04
(C) 0.032
(D) 0.028

Answer: (D) 0.028 · The council's preliminary key

Q17 AP EAPCET 2026 · 14 May · Shift 1 MCQ

If the normal drawn to the curve $y^4 = 16x^3$ at the point of intersection of this curve and the line $y = 2$ meets the X and Y axes at A and B respectively, then $OA + 3\,OB =$

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(A) 6
(B) 8
(C) 16
(D) 12

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

Q18 AP EAPCET 2026 · 14 May · Shift 2 MCQ

A particle is moving on a straight line so that its distance s from a fixed point at any time t is proportional to t^n. If v is the velocity and 'a' is the accelation of the particle at any time t, then $\frac{nas}{n-1} =$

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

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

Q19 AP EAPCET 2026 · 14 May · Shift 2 MCQ

The closest point on the parabola $y = x^2 + 7x + 2$ to the straight line $y = 3x - 2$ is

(A) $(-1, -4)$
(B) $(1, 10)$
(C) $(-2, -8)$
(D) $(0, 2)$

Answer: (C) $(-2, -8)$ · The council's preliminary key

Q20 AP EAPCET 2026 · 14 May · Shift 2 MCQ

If $y = a \log|x| + bx^2 + x$ has its extremum values at $x = -1$ and $x = 2$, then $(a, b) =$

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

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

Q21 AP EAPCET 2026 · 14 May · Shift 2 MCQ

The function $f(x) = 2x + \text{Cot}^{-1}x + \log\left(\sqrt{1+x^2} - x\right)$

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(A) decreases on $(0, \infty)$
(B) decreases on $(-\infty, 0)$
(C) neither increases nor decreases on $(-\infty, \infty)$
(D) increases on $(-\infty, \infty)$

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

Q22 AP EAPCET 2026 · 13 May · Shift 1 MCQ

If the length of the tangent at a point on the parabola $y^2 = 4ax$ is $4a\sqrt{5}$, then the length of the sub normal at that point is

(A) $4a$
(B) a
(C) $8a$
(D) $2a$

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

Q23 AP EAPCET 2026 · 13 May · Shift 1 MCQ

If the acute angle between the parabolas $y = 8x - x^2$ and $y = x^2 - 4x$ is θ, then $\tan\theta =$

(A) 1
(B) $\sqrt{3}$
(C) $\frac{15}{17}$
(D) $\frac{12}{31}$

Answer: (D) $\frac{12}{31}$ · The council's preliminary key

Q24 AP EAPCET 2026 · 13 May · Shift 1 MCQ

If the local maximum 'M' and local minimum 'm' of the function $f(x) = x - \frac{x^2}{2} - xe^{2-x}$ exist at $x = \alpha$ and β respectively, then $2\alpha m + \beta M =$

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

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

Q25 AP EAPCET 2026 · 13 May · Shift 2 MCQ

The function $f(x) = x^{\left(\frac{1}{x}\right)}$ is

(A) increasing in $(1, \infty)$
(B) decreasing in $(1, \infty)$
(C) increasing in $(1, e)$ and decreasing in (e, ∞)
(D) decreasing in $(1, e)$ and increasing in (e, ∞)

Answer: (C) increasing in $(1, e)$ and decreasing in (e, ∞) · The council's preliminary key

Q26 AP EAPCET 2026 · 13 May · Shift 2 MCQ

Let the normal drawn at a point P on the curve $y^2 - 3x^2 + y + 10 = 0$ intersect the Y-axis at $\left(0, \frac{3}{2}\right)$. If m is the slope of the tangent at P to the curve, then $|m| =$

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

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

Q27 AP EAPCET 2026 · 13 May · Shift 2 MCQ

The angle of intersection of the curves $x^2 - y^2 = a^2$ and $x^2 + y^2 = a^2\sqrt{2}$ is

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

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

Q28 AP EAPCET 2026 · 12 May · Shift 1 MCQ

At $\theta = \frac{\pi}{2}$, the length of the tangent to the curve $x = a(\theta + \sin\theta)$ and $y = a(1 - \cos\theta)$ is

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

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

Q29 AP EAPCET 2026 · 12 May · Shift 1 MCQ

In the interval $(-\infty, 0)$ the function $f(x) = x^2 + \frac{128}{x}$

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(A) has only one local minimum value at $x = 4$
(B) has one maximum and one minimum at $x = 4$ and $x = -4$ respectively
(C) is increasing
(D) is decreasing

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

Q30 AP EAPCET 2026 · 12 May · Shift 2 MCQ

The slope of the tangent drawn at a point A on a curve $y = f(x)$ is K. If P, Q, R and S are respectively the lengths of tangent, normal, sub tangent and subnormal drawn at A, then

(A) $KRQ = PS$
(B) $\frac{KR}{Q} = \frac{P}{S}$
(C) $KPR = SQ$
(D) $\frac{KP}{R} = \frac{S}{Q}$

Answer: (A) $KRQ = PS$ · The council's preliminary key

Q31 AP EAPCET 2026 · 12 May · Shift 2 MCQ

The tangent and the normal drawn at a point $P(\alpha, \beta)$ on the curve $y = f(x)$ cut the X-axis at T and N respectively. If the projection of P on X-axis is $A(\alpha, 0)$, then $(PT)^2 + (PN)^2 =$

(A) $(PA + AT)^2$
(B) $(TA + AN)^2$
(C) $(PA + AN)^2$
(D) $(PT + TN)^2$

Answer: (B) $(TA + AN)^2$ · The council's preliminary key

Q32 AP EAPCET 2026 · 12 May · Shift 2 MCQ

If the maximum value of $x^{\alpha}(24 - x)^{\beta}$ exists at $x = 9$, then $\alpha : \beta =$

(A) $1 : 2$
(B) $6 : 7$
(C) $6 : 8$
(D) $3 : 5$

Answer: (D) $3 : 5$ · The council's preliminary key

Q33 TS EAPCET 2026 · 11 May · Shift 1 MCQ

The function $f(x) = x|x - 1| + |x + 2|$ is

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(A) increasing in $(-\infty, -2) \cup (1, \infty)$ and decreasing in $(-2, 1)$
(B) decreasing in $(-\infty, -2) \cup (1, \infty)$ and increasing in $(-2, 1)$
(C) monotonically decreasing on R
(D) monotonically increasing on R

Answer: (D) monotonically increasing on R · The council's preliminary key

Q34 TS EAPCET 2026 · 11 May · Shift 1 MCQ

If a tangent drawn at the point $P(h, k)$, where $h, k \in Z$, on the curve $y = 2x^3 + 3x^2 - 4x - 1$ passes through the point $Q(2, 8)$, then $PQ =$

(A) $\sqrt{65}$
(B) 5
(C) 13
(D) $\sqrt{85}$

Answer: (A) $\sqrt{65}$ · The council's preliminary key

Q35 TS EAPCET 2026 · 11 May · Shift 1 MCQ

If the base of an isosceles triangle is $3\sqrt{2}$ feet and the two equal sides of it are increasing at the rate of 1 ft/s, then the rate of increase of its area (in sq.ft/sec) when the angle between the equal sides is a right angle is

(A) $3\sqrt{3}$
(B) $\sqrt{3}$
(C) 9
(D) 3

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

Q36 TS EAPCET 2026 · 11 May · Shift 1 MCQ

If $1^\circ \approx 0.01745$ then the approximate value of $\sec 29^\circ$ is

(A) 1.1530
(B) 1.1430
(C) 1.1525
(D) 1.1493

Answer: (B) 1.1430 · The council's preliminary key

Q37 TS EAPCET 2026 · 11 May · Shift 2 MCQ

The edges of a cuboid are measured with a scale having an error of 0.01 cm per cm. If the dimensions of the cuboid are $(l, b, h) = (12, 5, 7)$, then the percentage error in volume of the cuboid is

(A) 1.79
(B) 17.9
(C) 3
(D) 3.5

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

Q38 TS EAPCET 2026 · 11 May · Shift 2 MCQ

If the line $2x + y = 7$ touches the curve $y = f(x)$ at $x = \frac{1}{2}$, then the sum of the lengths of normal and subnormal is

(A) $6 + 2\sqrt{5}$
(B) $6\left(2 + \sqrt{5}\right)$
(C) $12 + \sqrt{5}$
(D) $7 + 5\sqrt{5}$

Answer: (B) $6\left(2 + \sqrt{5}\right)$ · The council's preliminary key

Q39 TS EAPCET 2026 · 11 May · Shift 2 MCQ

If P is any point on the curve $y^2 = 4ax$, other than the origin, then the length of the subtangent at P, y-coordinate of P and the length of the subnormal at P are in

(A) arithmetic progression
(B) arithmetic-Geometric progression
(C) hormonic progression
(D) geometric progression

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

Q40 TS EAPCET 2026 · 11 May · Shift 2 MCQ

If the local maximum value of the real valued function $f(x) = 2(x^3 - 1) - 3ax(x + 4a)$, $a > 0$ is 54, then $a =$

(A) 4
(B) 2
(C) 9
(D) 27

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

Q41 TS EAPCET 2026 · 10 May · Shift 1 MCQ

Approximate volume of a cone whose semi vertical angle is $\mathrm{Tan}^{-1}(3)$ and base radius is 15.001 is

(A) $(375.025)\pi$
(B) $(325.025)\pi$
(C) $(375.075)\pi$
(D) $(325.075)\pi$

Answer: (C) $(375.075)\pi$ · The council's preliminary key

Q42 TS EAPCET 2026 · 10 May · Shift 1 MCQ

If $f(x) = xe^{x^2-2x-3}$ is a real valued function, then f is

(A) a monotonically decreasing function
(B) an increasing function in the interval $(-1, 3)$ and decreasing function in the interval $(-\infty, -1) \cup (3, \infty)$
(C) a monotonically increasing function
(D) a decreasing function in the interval $(-1, 3)$ and increasing function in the interval $(-\infty, -1) \cup (3, \infty)$

Answer: (C) a monotonically increasing function · The council's preliminary key

Q43 TS EAPCET 2026 · 10 May · Shift 1 MCQ

The local minimum value of the function $f(x) = 2x - 3\text{Tan}^{-1}x$ is

(A) $3\text{Tan}^{-1}\left(\frac{1}{\sqrt{2}}\right) - \sqrt{2}$
(B) $\sqrt{2} - 3\text{Tan}^{-1}\left(\frac{1}{\sqrt{2}}\right)$
(C) $3\text{Tan}^{-1}(\sqrt{2}) - \frac{1}{\sqrt{2}}$
(D) $\frac{1}{\sqrt{2}} - 3\text{Tan}^{-1}(\sqrt{2})$

Answer: (B) $\sqrt{2} - 3\text{Tan}^{-1}\left(\frac{1}{\sqrt{2}}\right)$ · The council's preliminary key

Q44 TS EAPCET 2026 · 10 May · Shift 2 MCQ

The area of a triangle is obtained with lengths of two sides and included angle between them. If the angle is measured as $60°20'$ instead of $60°$, then the percentage error in its area is

(A) $\frac{5\pi}{54}$
(B) $\frac{5\pi}{27\sqrt{3}}$
(C) $\frac{5\sqrt{3}\pi}{27}$
(D) $\frac{5\pi}{27}$

Answer: (B) $\frac{5\pi}{27\sqrt{3}}$ · The council's preliminary key

Q45 TS EAPCET 2026 · 10 May · Shift 2 MCQ

If the rate of change of volume of a cube and that of its surface area are numerically equal, then the length of its diagonal is

(A) $2\sqrt{3}$
(B) $\sqrt{3}$
(C) $4\sqrt{3}$
(D) $6\sqrt{3}$

Answer: (C) $4\sqrt{3}$ · The council's preliminary key

Q46 TS EAPCET 2026 · 10 May · Shift 2 MCQ

If the nearest point on the parabola $y^2 = 4x$ to the given point $P(-1, 4)$ is $Q(h, k)$ and $PQ = d$, then $h^2 + k^2 + d^2 =$

(A) 13
(B) 14
(C) 17
(D) 9

Answer: (A) 13 · The council's preliminary key

Q47 TS EAPCET 2026 · 10 May · Shift 2 MCQ

If P and Q are the points of intersection of the straight line $x = 1$ and the curve $x^2 + xy + y^2 = 7$ then the acute angle between the normals drawn at P and Q is

(A) $\frac{\pi}{2}$
(B) $\frac{\pi}{4}$
(C) $\text{Tan}^{-1}\left(\frac{15}{29}\right)$
(D) $\text{Tan}^{-1}\left(\frac{5}{7}\right)$

Answer: (C) $\text{Tan}^{-1}\left(\frac{15}{29}\right)$ · The council's preliminary key

Q48 TS EAPCET 2026 · 9 May · Shift 1 MCQ

Consider the following statements

Statement-I: The equation of the tangent to the curve $y = 3x^2 - 5$ drawn through the point $(1, 2)$ is $y = 6x - 4$

Statement-II: If L, M, N are respectively the lengths of the tangent, normal and sub normal drawn to a curve at a point (α, β), then $\frac{(L)(N)}{M} = \beta^2$

Which of the following is correct?

(A) Both statements I and II are correct
(B) Statement I is correct but statement II is not correct
(C) Statement I is not correct but statement II is correct
(D) Both statements I and II are not correct

Answer: (D) Both statements I and II are not correct · The council's preliminary key

Q49 TS EAPCET 2026 · 9 May · Shift 1 MCQ

In the interval $[-5, 5]$, if the function $f(x) = (x+3)^2(x-2)^3$ is increasing on $S = \{x \mid -5 \leq x < \alpha \text{ and } \beta < x \leq 5\}$, then $f(\alpha) - f(\beta) =$

(A) -108
(B) 108
(C) 72
(D) -72

Answer: (B) 108 · The council's preliminary key

Q50 TS EAPCET 2026 · 9 May · Shift 1 MCQ

If the angle between the curves $y^2 = 4x$ and $y = ax^2 - 5$ at the point $(1, 2)$ is α, then $(a-2)|\tan\alpha| =$

(A) 13
(B) $\frac{13}{3}$
(C) $\frac{5}{13}$
(D) $\frac{13}{5}$

Answer: (B) $\frac{13}{3}$ · The council's preliminary key

Q51 TS EAPCET 2026 · 9 May · Shift 1 MCQ

A rectangle is inscribed in a parabola $y = 9 - x^2$ such that two of its vertices are on the X-axis and another two on the parabola. The dimensions of such rectangle lying above the X-axis and having maximum area is

(A) $6, 5\sqrt{3}$
(B) $6, 2\sqrt{3}$
(C) $9, 6$
(D) $5, 3$

Answer: (B) $6, 2\sqrt{3}$ · The council's preliminary key

Q52 TS EAPCET 2026 · 9 May · Shift 2 MCQ

By the application of derivatives, the approximate value of $\sqrt[5]{242}$ is

(A) 2.9085
(B) 2.9975
(C) 2.9527
(D) 2.8529

Answer: (B) 2.9975 · The council's preliminary key

Q53 TS EAPCET 2026 · 9 May · Shift 2 MCQ

If the displacement S of a particle moving along a straight line is given by $S = t^3 - 3t^2 + 3t - 4$, then the time interval in which S is increasing is

(A) only $(1, \infty)$
(B) only $[0, 1)$
(C) $[0, \infty)$
(D) only $[3, \infty)$

Answer: (C) $[0, \infty)$ · The council's preliminary key

Q54 TS EAPCET 2026 · 9 May · Shift 2 MCQ

If θ is the angle between the parabolas $y^2 = 108x$ and $x^2 = 32y$, then $\cos 2\theta =$

(A) $\frac{13}{5\sqrt{10}}$
(B) $\frac{9}{5\sqrt{10}}$
(C) $\frac{81}{125}$
(D) $\frac{44}{125}$

Answer: (D) $\frac{44}{125}$ · The council's preliminary key

Q55 TS EAPCET 2026 · 9 May · Shift 2 MCQ

If $f(x) = \log(2x - 3) - 2x^2 + 6x - 4$ is a real valued function then the interval in which f is an increasing function is

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

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

Q56 TS EAPCET 2026 · 9 May · Shift 2 MCQ

If m and M are respectively the absolute minimum and absolute maximum values of the function $f(x) = |2x^2 - x - 6| + 2x - 3$ in the interval $[-2, 4]$, then $2M + 8m =$

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(A) 154
(B) 6
(C) 8
(D) 150

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

Q57 AP EAPCET 2025 · 27 May · Shift 1 MCQ

The difference between the absolute maximum and absolute minimum values of the function $f(x) = 2x^3 - 15x^2 + 36x - 30$ on $[-1, 4]$ is

(A) 80
(B) 1
(C) 85
(D) 4

Answer: (C) 85 · The council's preliminary key

Q58 AP EAPCET 2025 · 27 May · Shift 1 MCQ

If $f(x) = xe^{x(1-x)}, x \in \mathbb{R}$, then $f(x)$ is

(A) increasing on $\left[-\frac{1}{2}, 1\right]$
(B) decreasing on $\mathbb{R}$
(C) increasing on $\mathbb{R}$
(D) decreasing on $\left[-\frac{1}{2}, 1\right]$

Answer: (A) increasing on $\left[-\frac{1}{2}, 1\right]$ · The council's preliminary key

Q59 AP EAPCET 2025 · 27 May · Shift 1 MCQ

The angle between the curves $y^2 = x$ and $x^2 = y$ at the point $(1, 1)$ is

(A) $\mathrm{Tan}^{-1}\left(\frac{4}{3}\right)$
(B) $\mathrm{Tan}^{-1}\left(\frac{3}{4}\right)$
(C) 90°
(D) 45°

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

Q60 AP EAPCET 2025 · 26 May · Shift 1 MCQ

If the area of a square is 575 square units, then the approximate value of its side is

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(A) 23.9792
(B) 23.7992
(C) 23.8687
(D) 23.7868

Answer: (A) 23.9792 · The council's preliminary key

Q61 AP EAPCET 2025 · 26 May · Shift 1 MCQ

If the tangent of the curve $4y^3 = 3ax^2 + x^3$ drawn at the point (a, a) forms a triangle of area $\frac{25}{24}$ sq.units with the coordinate axes then $a =$

(A) ± 10
(B) ± 5
(C) ± 6
(D) ± 3

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

Q62 AP EAPCET 2025 · 26 May · Shift 1 MCQ

If the function $f(x) = \sin x - \cos^2 x$ is defined on the interval $[-\pi, \pi]$, then f is strictly increasing in the interval

(A) $\left(\frac{-5\pi}{6}, \frac{-\pi}{6}\right) \cup \left(\frac{-\pi}{6}, \frac{\pi}{2}\right)$
(B) $\left(\frac{-\pi}{2}, \frac{-\pi}{6}\right)$
(C) $\left(\frac{-5\pi}{6}, \frac{\pi}{2}\right)$
(D) $\left(\frac{-5\pi}{6}, \frac{-\pi}{2}\right) \cup \left(\frac{-\pi}{6}, \frac{\pi}{2}\right)$

Answer: (D) $\left(\frac{-5\pi}{6}, \frac{-\pi}{2}\right) \cup \left(\frac{-\pi}{6}, \frac{\pi}{2}\right)$ · The council's preliminary key

Q63 AP EAPCET 2025 · 26 May · Shift 2 MCQ

If the tangent to the curve $xy + ax + by = 0$ at $(1, 1)$ makes an angle $\text{Tan}^{-1}2$ with X-axis, then $\frac{ab}{a+b} =$

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

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

Q64 AP EAPCET 2025 · 26 May · Shift 2 MCQ

If the displacement S of a particle travelling along a straight line in t seconds is given by $S = 2t^3 + 2t^2 - 2t - 3$, then the time taken (in seconds) by the particle to change its direction is

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

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

Q65 AP EAPCET 2025 · 26 May · Shift 2 MCQ

If $\mathrm{P}(\alpha, \beta)$ is a point on the curve $9x^2 + 4y^2 = 144$ in the first quadrant and the minimum area of the triangle formed by the tangent of the curve at P with the coordinate axis is S, then

(A) $S = \sqrt{\alpha\beta}$
(B) $S = \alpha\beta$
(C) $S = 2\sqrt{\alpha\beta}$
(D) $S = 2\,\alpha\beta$

Answer: (D) $S = 2\,\alpha\beta$ · The council's preliminary key

Q66 AP EAPCET 2025 · 24 May · Shift 1 MCQ

If the surface area of a spherical bubble is increasing at the rate of 4 sq.cm/sec, then the rate of change in its volume (in cubic cm/sec) when its radius is 8 cms is

(A) 8
(B) 12
(C) 15
(D) 16

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

Q67 AP EAPCET 2025 · 24 May · Shift 1 MCQ

The number of turning points of the curve $f(x) = 2\cos x - \sin 2x$ in the interval $[-\pi, \pi]$ is

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

Answer: (D) 2 · Checked by our team

Q68 AP EAPCET 2025 · 24 May · Shift 1 MCQ

The radius and the height of a right circular solid cone are measured as 7 feet each. If there is an error of 0.002 ft for every feet in measuring them, then the error in the total surface area of the cone (in sq. ft) is

(A) $(0.088)(\sqrt{2}+1)$
(B) $(0.616)(\sqrt{2}+1)$
(C) $(0.616)(\sqrt{2})$
(D) $(0.088)(\sqrt{2})$

Answer: (B) $(0.616)(\sqrt{2}+1)$ · The council's preliminary key

Q69 AP EAPCET 2025 · 23 May · Shift 1 MCQ

P and Q are the ends of a diameter of the circle $x^2+y^2=a^2\left(a>\frac{1}{\sqrt{2}}\right)$. s and t are the lengths of the perpendiculars drawn from P and Q onto the line $x+y=1$ respectively. When the product st is maximum, the greater value among s,t is

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

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

Q70 AP EAPCET 2025 · 23 May · Shift 1 MCQ

Let $P(x)=x^4+ax^3+bx^2+cx+d$ be such that $x=0$ is the only real root of $P^1(x)=0$. If $P(-1)<P(1)$, then in the interval $[-1,1]$

(A) $P(-1)$ is not minimum of $P(x)$, but $P(1)$ is the maximum of $P(x)$
(B) $P(-1)$ is minimum of $P(x)$, but $P(1)$ is not the maximum of $P(x)$
(C) Neither $P(-1)$ is the minimum nor $P(1)$ is the maximum of $P(x)$
(D) $P(-1)$ is the minimum and $P(1)$ is the maximum of $P(x)$

Answer: (A) $P(-1)$ **is not minimum of** $P(x)$**, but** $P(1)$ **is the maximum of** $P(x)$ · The council's preliminary key

Q71 AP EAPCET 2025 · 23 May · Shift 1 MCQ

If the volume of a sphere is increasing at the rate of 12 c.c. / sec, then the rate (in sq. cm/sec) at which its surface area is increasing, when the diameter of the sphere is 12 cm is

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

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

Q72 AP EAPCET 2025 · 23 May · Shift 1 MCQ

If the lengths of the tangent, subtangent, normal and subnormal for the curve $y = x^2 + x - 1$ at the point $(1, 1)$ are a, b, c and d respectively, then their increasing order is

(A) b, d, a, c
(B) b, a, c, d
(C) a, b, c, d
(D) b, a, d, c

Answer: (D) b, a, d, c · The council's preliminary key

Q73 AP EAPCET 2025 · 23 May · Shift 2 MCQ

The interval in which the function $f(x) = \text{Tan}^{-1}(\sin x + \cos x)$ is an increasing function, is

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

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

Q74 AP EAPCET 2025 · 23 May · Shift 2 MCQ

The slope of a tangent drawn at the point $P(\alpha, \beta)$ lying on the curve $y = \dfrac{1}{2x - 5}$ is -2. If P lies in the fourth quadrant, then $\alpha - \beta =$

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

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

Q75 AP EAPCET 2025 · 23 May · Shift 2 MCQ

The function $f(x) = xe^{-x}\ \forall x \in \mathbb{R}$ attains a maximum value at $x = k$, then $k =$

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

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

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Q76 AP EAPCET 2025 · 23 May · Shift 2 MCQ

If m and M are the absolute minimum and absolute maximum values of the function $f(x) = 2\sqrt{2}\sin x - \tan x$ in the interval $[0, \pi/3]$, then $m + M =$

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

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

Q77 AP EAPCET 2025 · 22 May · Shift 1 MCQ

If the tangent drawn at the point (α, β) on the curve $x^{2/3} + y^{2/3} = 4$ is parallel to the line $\sqrt{3}x + y = 1$, then $\alpha^2 + \beta^2 =$

(A) 10
(B) 9
(C) 28
(D) 19

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

Q78 AP EAPCET 2025 · 22 May · Shift 1 MCQ

The displacement S of a particle measured from a fixed point O on a line is given by $S = t^3 - 16t^2 + 64t - 16$. Then the time at which displacement of the particle is maximum is

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

Answer: (C) $\frac{8}{3}$ · The council's preliminary key

Q79 AP EAPCET 2025 · 22 May · Shift 1 MCQ

If the extreme value of the function $f(x) = \frac{4}{\sin x} + \frac{1}{1-\sin x}$ in $\left[0, \frac{\pi}{2}\right]$ is m and it exists at $x = k$, then $\cos k =$

(A) $\frac{\sqrt{m}}{4}$
(B) $\frac{\sqrt{m+1}}{\sqrt{2}}$
(C) $\frac{\sqrt{5}}{\sqrt{m}}$
(D) $\frac{1}{m}$

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

Q80 AP EAPCET 2025 · 22 May · Shift 1 MCQ

The interval in which the curve represented by $f(x) = 2x + \log\left(\frac{x}{2+x}\right)$ is increasing is

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

Answer: (C) $(-\infty, -2) \cup (0, \infty)$ · The council's preliminary key

Q81 AP EAPCET 2025 · 22 May · Shift 2 MCQ

If the tangent drawn at the point (x_1, y_1), $x_1, y_1 \in N$ on the curve $y = x^4 - 2x^3 + x^2 + 5x$ passes through origin, then $x_1 + y_1 =$

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

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

Q82 AP EAPCET 2025 · 22 May · Shift 2 MCQ

Which one of the following functions is monotonically increasing in its domain?

(A) $f(x) = \log(1+x) - x + \frac{x^2}{2}$
(B) $g(x) = 2\,\mathrm{Tan}^{-1}x - x - 1$
(C) $h(x) = 4\cos x + x$
(D) $u(x) = \log(1+x) - \frac{x}{x+1}$

Answer: (A) $f(x) = \log(1+x) - x + \frac{x^2}{2}$ · The council's preliminary key

Q83 AP EAPCET 2025 · 22 May · Shift 2 MCQ

If β is an angle between the normals drawn to the curve $x^2 + 3y^2 = 9$ at the points $(3\cos\theta, \sqrt{3}\sin\theta)$ and $(-3\sin\theta, \sqrt{3}\cos\theta)$, $\theta \in \left(0, \frac{\pi}{2}\right)$, then

(A) $\tan\beta = \frac{1}{\sqrt{3}}\sec 2\theta$
(B) $\cot\beta = \sqrt{3}\,\mathrm{cosec}\,2\theta$
(C) $\sqrt{3}\cot\beta = \sin 2\theta$
(D) $\cot\beta = \frac{1}{\sqrt{2}}\sec 2\theta$

Answer: (C) $\sqrt{3}\cot\beta = \sin 2\theta$ · The council's preliminary key

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Q84 AP EAPCET 2025 · 22 May · Shift 2 MCQ

If the area of a right angled triangle with hypotenuse 5 is maximum, then its perimeter is

(A) 12
(B) $2\sqrt{3}+\sqrt{13}+5$
(C) $7+\sqrt{21}$
(D) $5(\sqrt{2}+1)$

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

Q85 AP EAPCET 2025 · 21 May · Shift 1 MCQ

The area (in square units) of the triangle formed by the X – axis, the tangent and the normal drawn at (1,1) to the curve $x^3+y^3=2xy$ is

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

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

Q86 AP EAPCET 2025 · 21 May · Shift 1 MCQ

If the function $y=g(x)$ representing the slopes of the tangents drawn to the curve $y=3x^4-5x^3-12x^2+18x+3$ is strictly increasing then the domain of $g(x)$ is

(A) $\left[-\frac{1}{2},\frac{4}{3}\right]$
(B) $\left(\frac{-1}{2},\frac{4}{3}\right)$
(C) $\mathbb{R}-\left(\frac{-1}{2},\frac{3}{4}\right)$
(D) $\mathbb{R}-\left[\frac{-1}{2},\frac{4}{3}\right]$

Answer: (D) $\mathbb{R}-\left[\frac{-1}{2},\frac{4}{3}\right]$ · The council's preliminary key

Q87 AP EAPCET 2025 · 21 May · Shift 2 MCQ

If the normal drawn at the point P on the curve $y=x\log x$ is parallel to the line $2x-2y=3$, then $P=$

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

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

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Q88 AP EAPCET 2025 · 21 May · Shift 2 MCQ

If the curves $y^2 = 16x$ and $9x^2 + \alpha y^2 = 25$ intersect at right angles, then $\alpha =$

(A) 6
(B) 9
(C) $\frac{9}{2}$
(D) 3

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

Q89 AP EAPCET 2025 · 21 May · Shift 2 MCQ

If the function $y = \sin x(1 + \cos x)$ is defined in the interval $[-\pi, \pi]$, then y is strictly increasing in the interval

(A) $\left(-\pi, -\frac{\pi}{3}\right) \cup \left(\frac{\pi}{3}, \pi\right)$
(B) $\left(\frac{\pi}{6}, \frac{\pi}{2}\right)$
(C) $\left(-\frac{\pi}{3}, \frac{\pi}{3}\right)$
(D) $\left(-\pi, -\frac{\pi}{6}\right) \cup \left(\frac{\pi}{6}, \pi\right)$

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

Q90 AP EAPCET 2025 · 21 May · Shift 2 MCQ

If the velocity of a particle moving on a straight line is proportional to the cube root of its displacement, then its acceleration is

(A) constant
(B) inversely proportional to its velocity
(C) proportional to its velocity
(D) proportional to its displacement

Answer: (B) inversely proportional to its velocity · The council's preliminary key

Q91 TS EAPCET 2025 · 4 May · Shift 1 MCQ

If the curves $y^2 = 12x - 3$ and $y^2 = 12 - kx$ cut each other orthogonally then the length of the sub tangent at $(1, b)$ on the curve $y^2 = 12 - kx$ is

(A) 4
(B) 6
(C) 5
(D) 12

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

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Q92 TS EAPCET 2025 · 4 May · Shift 1 MCQ

A rod of length 41 m with an end A on the floor and another end B on the wall perpendicular to the floor is sliding away horizontally from the wall at the rate of 3 ft/min. When the end B is at the height of 9 ft from the floor, then the rate at which the area of the triangle formed by the rod with wall and floor changes at that instant is (in ft/min)

(A) $-\frac{1519}{6}$
(B) $\frac{1618}{3}$
(C) $-\frac{1600}{3}$
(D) $\frac{1509}{6}$

Answer: (A) $-\frac{1519}{6}$ · The council's preliminary key

Q93 TS EAPCET 2025 · 4 May · Shift 1 MCQ

There is a possible error of 0.02 cm in measuring the base diameter of a right circular cone as 14 cm. If the semi-vertical angle of the cone is 45°, then the approximate error in its volume is (in cu. cm)

(A) 1.078
(B) 3.08
(C) 1.54
(D) 6.16

Answer: (C) 1.54 · The council's preliminary key

Q94 TS EAPCET 2025 · 4 May · Shift 1 MCQ

The real valued function $f(x) = \frac{x^2}{2} - \log\left(x^2 + x + 1\right)$ is

(A) Strictly decreasing in $(1, \infty)$
(B) Strictly increasing in $(1, \infty)$
(C) Strictly increasing in $(-\infty, 0)$
(D) Strictly decreasing in $(0, \infty)$

Answer: (B) Strictly increasing in $(1, \infty)$ · The council's preliminary key

Q95 TS EAPCET 2025 · 4 May · Shift 2 MCQ

If local maximum of $f(x) = \frac{ax + b}{(x-1)(x-4)}$ exists at $(2, -1)$, then $a + b =$

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

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

Q96 TS EAPCET 2025 · 4 May · Shift 2 MCQ

For the curve $\frac{x^n}{a^n}+\frac{y^n}{b^n}=2$, $(n\in\mathbb{N}\ \&\ n>1)$ the line $\frac{x}{a}+\frac{y}{b}=2$ is

(A) a normal for all values of n
(B) a normal for only values of n more than $\text{Max}\{a,b\}$
(C) a tangent for all values of n
(D) a tangent for only values of n more than $\text{Min}\{a,b\}$

Answer: (C) a tangent for all values of n · The council's preliminary key

Q97 TS EAPCET 2025 · 4 May · Shift 2 MCQ

The height of a cone with semi vertical angle $\frac{\pi}{3}$ is increasing at the rate of 2 units/min.

The rate at which the radius of the cone is to be decreased so as to have a fixed volume always is

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

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

Q98 TS EAPCET 2025 · 4 May · Shift 2 MCQ

The function $f(x)=2x^3-9ax^2+12a^2x+1$ where $a>0$ attains its local maximum and local minimum at p and q respectively. If $p^2=q$ then a =

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

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

Q99 TS EAPCET 2025 · 4 May · Shift 2 MCQ

If the percentage error in the radius of a circle is 3, then the percentage error in its area is

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

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

Q100 TS EAPCET 2025 · 3 May · Shift 1 MCQ

If the normal drawn at the point P on the curve $y^2 = x^3 - x + 1$ makes equal intercepts on the coordinate axes, then the equation of the tangent drawn to the curve at P is

(A) $x - y = 0$
(B) $x - y = 4$
(C) $x - y = 1$
(D) $x - y = 2$

Answer: (A) $x - y = 0$ · The council's preliminary key

Q101 TS EAPCET 2025 · 3 May · Shift 1 MCQ

If a balloon lying at an altitude of 30 m from an observer at a particular instant is moving horizontally at the rate of 1 m/s away from him, then the rate at which the balloon is moving away directly from the observer at the 40th second is (in m/s)

(A) 1.2
(B) 0.9
(C) 0.6
(D) 0.8

Answer: (D) 0.8 · The council's preliminary key

Q102 TS EAPCET 2025 · 3 May · Shift 1 MCQ

The approximate value of $\sqrt{6560}$ is

(A) 80.9939
(B) 80.9838
(C) 78.9939
(D) 78.9838

Answer: (A) 80.9939 · The council's preliminary key

Q103 TS EAPCET 2025 · 3 May · Shift 1 MCQ

A real valued function $f : [4, \infty) \to \mathbb{R}$ is defined as $f(x) = \left(x^2 + x + 1\right)^{(x^2 - 3x - 4)}$, then f is

(A) monotonically decreasing function
(B) monotonically increasing function
(C) increasing in $(4,5)$ and decreasing in $(5,\infty)$
(D) decreasing in $(4,5)$ and increasing in $(5,\infty)$

Answer: (B) monotonically increasing function · The council's preliminary key

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Q104 TS EAPCET 2025 · 3 May · Shift 2 MCQ

If the tangent and the normal drawn to the curve $xy^2 + x^2y = 12$ at the point $(1,3)$ meet the X-axis in T and N respectively, then TN =

(A) $\frac{7}{5}$
(B) $\frac{45}{7}$
(C) $\frac{3\sqrt{274}}{7}$
(D) $\frac{274}{35}$

Answer: (D) $\frac{274}{35}$ · The council's preliminary key

Q105 TS EAPCET 2025 · 3 May · Shift 2 MCQ

A man of 5 feet height is walking away from a light fixed at a height of 15 feet at the rate of K miles/hour. If the rate of increase of his shadow is $\frac{11}{5}$ feet/sec, then K =

(Take 1 mile = 5280 feet)

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

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

Q106 TS EAPCET 2025 · 3 May · Shift 2 MCQ

There is a possible error of 0.03 cm in a scale of length 1 foot with which the height of a closed right circular cylinder and the diameter of a sphere are measured as 3.5 feet each. If the radii of both cylinder and sphere are same, then the approximate error in the sum of the surface areas of both cylinder and sphere is (in square feet)

(A) 0.385
(B) 0.0962
(C) 0.77
(D) 0.1925

Answer: (D) 0.1925 · The council's preliminary key

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Q107 TS EAPCET 2025 · 3 May · Shift 2 MCQ

For a real number 'a', if a real valued function $f(x) = 4x^3 + ax^2 + 3x - 2$ is monotonic in its domain, then the range of 'a' is

(A) $(-6, 6)$
(B) Empty set
(C) $(-2, 2)$
(D) $(2, 4)$

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

Q108 TS EAPCET 2025 · 3 May · Shift 2 MCQ

If the point $\mathrm{P}(x_1, y_1)$ lying on the curve $y = x^2 - x + 1$ is the closest point to the line $y = x - 3$ then the perpendicular distance from P to the line $3x + 4y - 2 = 0$ is

(A) $\frac{16}{5}$
(B) 4
(C) 1
(D) $\frac{7}{5}$

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

Q109 TS EAPCET 2025 · 2 May · Shift 1 MCQ

A variable straight-line L with negative slope passes through the point $(4, 9)$ and cuts the positive coordinate axes in A and B. If O is the origin, then the minimum value of $OA + OB$ is

(A) 25
(B) 12
(C) 13
(D) 5

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

Q110 TS EAPCET 2025 · 2 May · Shift 1 MCQ

The acute angle between the curves $y = 3x^2 - 2x - 1$ and $y = x^3 - 1$ at their point of intersection which lies in the first quadrant is

(A) $\mathrm{Tan}^{-1}\left(\frac{2}{121}\right)$
(B) $\mathrm{Tan}^{-1}(2)$
(C) $\mathrm{Tan}^{-1}\left(\frac{1}{13}\right)$
(D) $\frac{\pi}{2}$

Answer: (A) $\mathrm{Tan}^{-1}\left(\frac{2}{121}\right)$ · The council's preliminary key

Q111 TS EAPCET 2025 · 2 May · Shift 1 MCQ

If the rate of change of the slope of the tangent drawn to the curve $y = x^3 - 2x^2 + 3x - 2$ at the point $(2, 4)$ is k times the rate of change of its abscissa, then $k =$

(A) 2
(B) 4
(C) 6
(D) 8

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

Q112 TS EAPCET 2025 · 2 May · Shift 1 MCQ

If $1^\circ = 0.0175$ radians, then the approximate value of $\sec 58^\circ$ is

(A) 1.9899
(B) 1.8788
(C) 1.8511
(D) 1.9677

Answer: (B) 1.8788 · The council's preliminary key

Q113 TS EAPCET 2025 · 2 May · Shift 1 MCQ

If $f(x) = x + \log\left(\frac{x-1}{x+1}\right)$ is a well-defined real valued function then f is

(A) monotonically decreasing function
(B) monotonically increasing function
(C) increasing in $(1, \infty)$ and decreasing in $(-\infty, -1)$
(D) decreasing in $(1, \infty)$ and increasing in $(-\infty, -1)$

Answer: (B) monotonically increasing function · The council's preliminary key

Q114 TS EAPCET 2025 · 2 May · Shift 1 MCQ

A real valued function $f(x) = |x^2 - 3x + 2| + 2x - 3$ is defined on $[-2, 1]$. If m and M are absolute minimum and absolute maximum values of f respectively then $M - 4m =$

(A) 0
(B) 1
(C) 15
(D) 10

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

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Q115 TS EAPCET 2025 · 2 May · Shift 2 MCQ

The radius of a cone of height 9 units is changed from 2 units to 2.12 units. The exact change and approximate change in the volume of the cone are respectively

(A) $(1.4437)\pi, (1.44)\pi$
(B) $(1.4832)\pi, (1.479)\pi$
(C) $(1.4842)\pi, (1.48)\pi$
(D) $(1.4832)\pi, (1.44)\pi$

Answer: (D) $(1.4832)\pi, (1.44)\pi$ · The council's preliminary key

Q116 TS EAPCET 2025 · 2 May · Shift 2 MCQ

The local maximum value l and local minimum value m of $f(x) = \frac{x^2+2x+2}{x+1}$ in $\mathbb{R} - \{-1\}$ exist at α, β respectively, then $\frac{l+m}{\alpha+\beta} =$

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

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

Q117 TS EAPCET 2025 · 2 May · Shift 2 MCQ

P(5,2) is a point on the curve $y = f(x)$ and $\frac{7}{2}$ is the slope of the tangent to the curve at P. The area of the triangle (in sq. units) formed by the tangent and the normal to the curve at P with x-axis is

(A) 35
(B) $\frac{35}{2}$
(C) $\frac{53}{7}$
(D) $\frac{53}{14}$

Answer: (C) $\frac{53}{7}$ · The council's preliminary key

Q118 TS EAPCET 2025 · 2 May · Shift 2 MCQ

If a particle is moving in a straight line so that after t seconds its distance S (in cms) from a fixed point on the line is given by $S = f(t) = t^3 - 5t^2 + 8t$ then the acceleration of the particle at $t = 5$ sec is (in cm/sec^2)

(A) 10
(B) 30
(C) 20
(D) 40

Answer: (C) 20 · The council's preliminary key

Q119 AP EAPCET 2024 · 23 May · Shift 1 MCQ

A is a point on the circle with radius 8 and centre at O. A particle P is moving on the circumference of the circle starting from A. M is the foot of the perpendicular from P on OA and $\angle POM = \theta$. When OM=4 and $\frac{d\theta}{dt}$ = 6 radians/sec, then the rate of change of PM is (in units/sec)

(A) $24\sqrt{3}$
(B) 24
(C) $15\sqrt{3}$
(D) $48\sqrt{3}$

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

Q120 AP EAPCET 2024 · 22 May · Shift 1 MCQ

Equation of the normal to the curve $y = x^2 + x$ at the point $(1, 2)$ is

(A) $x - 3y + 5 = 0$
(B) $x + 3y + 7 = 0$
(C) $x + 3y + 5 = 0$
(D) $x + 3y - 7 = 0$

Answer: (D) $x + 3y - 7 = 0$ · The council's preliminary key

Q121 AP EAPCET 2024 · 22 May · Shift 1 MCQ

Displacement s of a particle at time t is expressed as $s = 2t^3 - 9t$. Find the acceleration at the time when the velocity vanishes.

(A) 6
(B) $6\sqrt{3}$
(C) $6\sqrt{6}$
(D) $3\sqrt{6}$

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

Q122 AP EAPCET 2024 · 22 May · Shift 1 MCQ

If a running track of 500 ft. is to be laid out enclosing a playground, the shape of which is a rectangle with a semicircle at each end, then the length of the rectangular portion such that the area of the rectangular portion is to be maximum is (in feet).

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(A) 100
(B) 125
(C) 150
(D) 200

Answer: (B) 125 · The council's preliminary key

Q123 AP EAPCET 2024 · 22 May · Shift 2 MCQ

The semi-vertical angle of a right circular cone is 45°. If the radius of the base of the cone is measured as 14 cm with an error of $\left(\frac{\sqrt{2}-1}{11}\right)$ cm, then the approximate error in measuring its total surface area is (in sq. cm)

(A) 14
(B) 8
(C) 5
(D) 3

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

Q124 AP EAPCET 2024 · 22 May · Shift 2 MCQ

If a man of height 1.8 mt. is walking away from the foot of a light pole of height 6 mt. with a speed of 7 km per hour on a straight horizontal road opposite to the pole, then the rate of change of the length of his shadow is (in kmph)

(A) 7
(B) 5
(C) 3
(D) 2

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

Q125 AP EAPCET 2024 · 22 May · Shift 2 MCQ

If the curves $2x^2 + ky^2 = 30$ and $3y^2 = 28x$ cut each other orthogonally, then $k =$

(A) 5
(B) 3
(C) 2
(D) 1

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

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Q126 AP EAPCET 2024 · 22 May · Shift 2 MCQ

The interval containing all the real values of x such that the real valued function $f(x) = \sqrt{x} + \frac{1}{\sqrt{x}}$ is strictly increasing is

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

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

Q127 AP EAPCET 2024 · 21 May · Shift 1 MCQ

The point which lies on the tangent drawn to the curve $x^4 e^y + 2\sqrt{y+1} = 3$ at the point $(1, 0)$ is

(A) $(2, 6)$
(B) $(2, -6)$
(C) $(-2, -6)$
(D) $(-2, 6)$

Answer: (D) $(-2, 6)$ · The council's preliminary key

Q128 AP EAPCET 2024 · 21 May · Shift 1 MCQ

If $f(x) = x^x$, then the interval in which $f(x)$ decreases is

(A) $\left[0, \frac{1}{e}\right]$
(B) $[0, e]$
(C) $\left[\frac{1}{e}, \infty\right]$
(D) $[0, e^e]$

Answer: (A) $\left[0, \frac{1}{e}\right]$ · The council's preliminary key

Q129 AP EAPCET 2024 · 21 May · Shift 1 MCQ

The number of all the values of x for which the function $f(x) = \sin x + \frac{1-\tan^2 x}{1+\tan^2 x}$ attains its maximum value on $[0,\ 2\pi]$ is

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

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

Q130 AP EAPCET 2024 · 21 May · Shift 2 MCQ

The value of c such that the straight line joining the points $(0, 3)$ and $(5, -2)$ is tangent to the curve $y = \frac{c}{x+1}$ is

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

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

Q131 AP EAPCET 2024 · 21 May · Shift 2 MCQ

If the percentage error in the radius of circle is 3, then the percentage error in its area is

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

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

Q132 AP EAPCET 2024 · 21 May · Shift 2 MCQ

The equation of the tangent to the curve $y = x^3 - 2x + 7$ at the point $(1, 6)$ is

(A) $y = x + 5$
(B) $x + y = 7$
(C) $2x + y = 8$
(D) $x + 2y = 13$

Answer: (A) $y = x + 5$ · The council's preliminary key

Q133 AP EAPCET 2024 · 21 May · Shift 2 MCQ

The distance (s) travelled by a particle in time t is given by $s = 4t^2 + 2t + 3$. The velocity of the particle when $t = 3$ seconds is

(A) 26 unit/sec
(B) 20 unit/sec
(C) 24 unit/sec
(D) 30 unit/sec

Answer: (A) 26 unit/sec · The council's preliminary key

Q134 AP EAPCET 2024 · 21 May · Shift 2 MCQ

If $a^2x^4 + b^2y^4 = c^6$ then maximum value of $xy =$

(A) $\frac{c^3}{2ab}$
(B) $\frac{c^3}{\sqrt{2ab}}$
(C) $\frac{c^3}{ab}$
(D) $\frac{c^3}{\sqrt{ab}}$

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

Q135 AP EAPCET 2024 · 20 May · Shift 1 MCQ

If $T = 2\pi\sqrt{\frac{L}{g}}$, g is a constant and the relative error in T is k times to the percentage error in L, then $\frac{1}{k} =$

(A) 2
(B) $\frac{1}{200}$
(C) 200
(D) $\frac{1}{2}$

Answer: (C) 200 · The council's preliminary key

Q136 AP EAPCET 2024 · 20 May · Shift 1 MCQ

The angle between the curves $y^2 = 2x$ and $x^2 + y^2 = 8$ is

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

Answer: (C) $\mathrm{Tan}^{-1}(3)$ · The council's preliminary key

Q137 AP EAPCET 2024 · 20 May · Shift 1 MCQ

If x, y are two positive integers such that $x + y = 20$ and the maximum value of x^3y is k at $x = \alpha, y = \beta$ then $\frac{k}{\alpha^2\beta^2} =$

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(A) $\frac{\alpha}{\beta}+\frac{\beta}{\alpha}$
(B) $\frac{\alpha}{\beta}-\frac{\beta}{\alpha}$
(C) $\frac{\alpha}{\beta}$
(D) $\frac{\alpha+\beta}{\alpha\beta}$

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

Q138 AP EAPCET 2024 · 20 May · Shift 2 MCQ

p_1 and p_2 are the perpendicular distances from the origin to the tangent and normal drawn at any point on the curve $x^{2/3}+y^{2/3}=a^{2/3}$ respectively. If $k_1p_1^2+k_2p_2^2=a^2$, then $k_1+k_2=$

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

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

Q139 AP EAPCET 2024 · 20 May · Shift 2 MCQ

The length of the subnormal at any point on the curve $y=\left(\frac{x}{2024}\right)^k$ is constant if the value of k is

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

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

Q140 AP EAPCET 2024 · 20 May · Shift 2 MCQ

The acute angle between the curves $x^2+y^2=x+y$ and $x^2+y^2=2y$ is

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

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

Q141 AP EAPCET 2024 · 19 May · Shift 2 MCQ

If $y=(1+a+a^2+\ldots)e^{nx}$, where a and n are constants, then the relative error in y is

(A) error in x
(B) percentage error in x
(C) n.(error in x)
(D) n.(Relative error in x)

Answer: (C) n.**(error in** x**)** · The council's preliminary key

Q142 AP EAPCET 2024 · 19 May · Shift 2 MCQ

If the equation of tangent at $(2, 3)$ on $y^2 = ax^3 + b$ is $y = 4x - 5$, then the value of $a^2 + b^2 =$

(A) 51
(B) 53
(C) 58
(D) 25

Answer: (B) 53 · The council's preliminary key

Q143 AP EAPCET 2024 · 18 May · Shift 1 MCQ

By considering $1' = 0.0175$, the approximate value of $\cot 45^\circ 2'$ is

(A) 1.07
(B) 0.965
(C) 1.035
(D) 0.93

Answer: (D) 0.93 · The council's preliminary key

Q144 AP EAPCET 2024 · 18 May · Shift 1 MCQ

A point is moving on the curve $y = x^3 - 3x^2 + 2x - 1$ and the y-coordinate of the point is increasing at the rate of 6 units per second. When the point is at $(2, -1)$, the rate of change of x-coordinate of the point is

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

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

Q145 AP EAPCET 2024 · 18 May · Shift 1 MCQ

The length of the tangent drawn at the point $p\left(\frac{\pi}{4}\right)$ on the curve $x^{2/3} + y^{2/3} = 2^{2/3}$ is

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

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

Q146 AP EAPCET 2024 · 18 May · Shift 1 MCQ

The set of all real values of 'a' such that the real valued function $f(x) = x^3 + 2ax^2 + 3(a+1)x + 5$ is strictly increasing in its entire domain is

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

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

Q147 TS EAPCET 2024 · 11 May · Shift 1 MCQ

For a given function $y = f(x)$, δy denotes the actual error in y corresponding to actual error δx in x and dy denotes the approximate value of δy. If $y = f(x) = 2x^2 - 3x + 4$ and $\delta x = 0.02$, then the value of $\delta y - dy$ when $x = 5$ is

(A) 0.0008
(B) 0.008
(C) 0.0004
(D) 0.004

Answer: (A) 0.0008 · The council's preliminary key

Q148 TS EAPCET 2024 · 11 May · Shift 1 MCQ

The length of the normal drawn at $t = \frac{\pi}{4}$ on the curve $x = 2(\cos 2t + t \sin 2t)$, $y = 4(\sin 2t + t \cos 2t)$ is

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

Answer: (B) $4\sqrt{1+\pi^2}$ · The council's preliminary key

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Q149 TS EAPCET 2024 · 11 May · Shift 1 MCQ

If Water is poured into a cylindrical tank of radius 3.5 ft at the rate of 1 cu ft/min, then the rate at which the level of the water in the tank increases (in ft/min) is

(A) $\frac{1}{154}$
(B) $\frac{8}{77}$
(C) $\frac{2}{77}$
(D) $\frac{1}{11}$

Answer: (C) $\frac{2}{77}$ · The council's preliminary key

Q150 TS EAPCET 2024 · 11 May · Shift 1 MCQ

If m and M are respectively the absolute minimum and absolute maximum values of a function $f(x) = 2x^3 + 9x^2 + 12x + 1$ defined on $[-3, 0]$, then $m + M =$

(A) -7
(B) 0
(C) 1
(D) 5

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

Q151 TS EAPCET 2024 · 10 May · Shift 1 MCQ

The approximate value of $\sec 59^\circ$ obtained by taking $1^\circ = 0.0174$ and $\sqrt{3} = 1.732$ is

(A) 1.9849
(B) 1.8493
(C) 1.9397
(D) 1.9948

Answer: (C) 1.9397 · The council's preliminary key

Q152 TS EAPCET 2024 · 10 May · Shift 1 MCQ

The equation of the normal drawn to the curve $y^3 = 4x^5$ at the point $(4, 16)$ is

(A) $20x + 3y = 128$
(B) $20x - 3y = 32$
(C) $3x - 20y + 308 = 0$
(D) $3x + 20y = 332$

Answer: (D) $3x + 20y = 332$ · The council's preliminary key

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Q153 TS EAPCET 2024 · 10 May · Shift 1 MCQ

A point P is moving on the curve $x^3y^4 = 2^7$. The x-coordinate of P is decreasing at the rate of 8 units per second. When the point P is at $(2, 2)$, the y- coordinate of P

(A) increases at the rate of 6 units per second
(B) decreases at the rate of 6 units per second
(C) increases at the rate of 4 units per second
(D) decreases at the rate of 4 units per second

Answer: (A) increases at the rate of 6 units per second · The council's preliminary key

Q154 TS EAPCET 2024 · 10 May · Shift 1 MCQ

If x and y are two positive integers such that $x + y = 24$ and x^3y^5 is maximum, then $x^2 + y^2 =$

(A) 288
(B) 296
(C) 306
(D) 320

Answer: (C) 306 · The council's preliminary key

Q155 TS EAPCET 2024 · 10 May · Shift 2 MCQ

The maximum interval in which the slopes of the tangents drawn to the curve $y = x^4 + 5x^3 + 9x^2 + 6x + 2$ increase is

(A) $\left[\frac{-3}{2}, -1\right]$
(B) $\left[1, \frac{3}{2}\right]$
(C) $R - \left[1, \frac{3}{2}\right]$
(D) $R - \left[\frac{-3}{2}, -1\right]$

Answer: (D) $R - \left[\frac{-3}{2}, -1\right]$ · The council's preliminary key

Q156 TS EAPCET 2024 · 10 May · Shift 2 MCQ

If $A = \{P(\alpha, \beta)/$ the tangent drawn at P to the curve $y^3 - 3xy + 2 = 0$ is a horizontal line$\}$ and $B = \{Q(a, b)/$ the tangent drawn at Q to the curve $y^3 - 3xy + 2 = 0$ is a vertical line$\}$ then $n(A) + n(B) =$

(A) 12
(B) 1
(C) 0
(D) 4

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

Q157 TS EAPCET 2024 · 10 May · Shift 2 MCQ

In a ΔABC, the sides b, c are fixed. In measuring angle A, if there is an error of δA, then the percentage error in measuring the length of the side a is

(A) $\frac{2\Delta\delta A}{R\sin A}\times 100$
(B) $2\times\frac{\delta A}{A}\times 100$
(C) $\frac{\Delta\delta A}{2R^2\sin^2 A}\times 100$
(D) $\frac{\Delta^2\delta A}{R\sin A}\times 100$

Answer: (C) $\frac{\Delta\delta A}{2R^2\sin^2 A}\times 100$ · The council's preliminary key

Q158 TS EAPCET 2024 · 10 May · Shift 2 MCQ

$y=f(x)$ and $x=g(y)$ are two curves and $P(x,y)$ is a common point of the two curves. If at P, on the curve $y=f(x)$, $\frac{dy}{dx}=Q(x)$ and at the same point P on the curve $x=g(y)$, $\frac{dx}{dy}=-Q(x)$, then

(A) the two curves have a common tangent
(B) the angle between two curves is 45°
(C) tangent drawn at P to one curve is normal to the other curve at P
(D) the two curves never intersect orthogonally

Answer: (C) tangent drawn at P to one curve is normal to the other curve at P · The council's preliminary key

Q159 TS EAPCET 2024 · 9 May · Shift 1 MCQ

The radius of a sphere is 7 cm. If an error of 0.08 sq.cm. is made in measuring it, then the approximate error (in cubic cm) found in its volume is

(A) 0.28
(B) 0.32
(C) 0.96
(D) 0.098

Answer: (A) 0.28 · The council's preliminary key

Q160 TS EAPCET 2024 · 9 May · Shift 1 MCQ

The curve $y=x^3-2x^2+3x-4$ intersects the horizontal line $y=-2$ at the point $\mathrm{P}(h,k)$. If the tangent drawn to this curve at P meets the X-axis at (x_1,y_1), then $x_1=$

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

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

Q161 TS EAPCET 2024 · 9 May · Shift 1 MCQ

A particle moving from a fixed point on a straight line travels a distance S metres in t sec. If $S = t^3 - t^2 - t + 3$, then the distance (in mts) travelled by the particle when it comes to rest is

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

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

Q162 TS EAPCET 2024 · 9 May · Shift 1 MCQ

If the interval in which the real valued function $f(x) = \log\left(\frac{1+x}{1-x}\right) - 2x - \frac{x^3}{1-x^2}$ is decreasing in (a, b), where $|b - a|$ is maximum, then $\frac{a}{b} =$

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

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

Q163 TS EAPCET 2024 · 9 May · Shift 2 MCQ

The approximate value of $\sqrt[3]{730}$ obtained by the application of derivatives is

(A) 9.0041
(B) 9.01
(C) 9.006
(D) 9.05

Answer: (A) 9.0041 · The council's preliminary key

Q164 TS EAPCET 2024 · 9 May · Shift 2 MCQ

If θ is the acute angle between the curves $y^2 = x$ and $x^2 + y^2 = 2$ then $\tan\theta =$

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

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

Q165 TS EAPCET 2024 · 9 May · Shift 2 MCQ

The vertical angle of a right circular cone is 60°. If water is being poured into the cone at the rate of $\frac{1}{\sqrt{3}}\ \mathrm{m}^3/\mathrm{min}$, then the rate (m/min) at which the radius of the water level is increasing when the height of the water level is 3m is

(A) $\frac{1}{3\sqrt{3}\pi}$
(B) $\frac{1}{9\sqrt{3}\pi}$
(C) $\frac{1}{9\pi}$
(D) $\frac{1}{3\pi}$

Answer: (C) $\frac{1}{9\pi}$ · The council's preliminary key

Q166 TS EAPCET 2024 · 9 May · Shift 2 MCQ

A right circular cone is inscribed in a sphere of radius 3 units. If the volume of the cone is maximum, then semi vertical angle of the cone is

(A) $\frac{\pi}{4}$
(B) $\frac{\pi}{6}$
(C) $\mathrm{Tan}^{-1}\left(\sqrt{2}\right)$
(D) $\mathrm{Tan}^{-1}\left(\frac{1}{\sqrt{2}}\right)$

Answer: (D) $\mathrm{Tan}^{-1}\left(\frac{1}{\sqrt{2}}\right)$ · The council's preliminary key

Q167 TS EAPCET 2024 · 9 May · Shift 2 MCQ

If $f(x) = kx^3 - 3x^2 - 12x + 8$ is strictly decreasing for all $x \in \mathbb{R}$ then

(A) $k < -\frac{1}{4}$
(B) $k > -\frac{1}{4}$
(C) $k > \frac{1}{4}$
(D) $k < \frac{1}{4}$

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

Q168 AP EAPCET 2023 · 19 May · Shift 1 MCQ

Let $f : \mathbb{R} \to \mathbb{R}$ be a continuous function. If $px + my + n = 0$ is a tangent drawn to the curve $y = f(x)$ at $x = \alpha$, then at $x = 0$, $\frac{d}{dx}\left(f(\alpha e^{2x})\right) =$

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(A) 0
(B) $\frac{p}{m}$
(C) $\frac{-2\alpha m}{p}$
(D) $\frac{-2p\alpha}{m}$

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

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Q169 AP EAPCET 2023 · 19 May · Shift 1 MCQ

In the interval $\left(\frac{1}{e}, e\right)$, a decreasing function among the following functions is

(A) $f(x) = \frac{\log x}{x}$
(B) $f(x) = x^2 \log x$
(C) $f(x) = x \log x$
(D) $f(x) = x^{-x}$

Answer: (D) $f(x) = x^{-x}$ · The council's preliminary key

Q170 AP EAPCET 2023 · 19 May · Shift 1 MCQ

If the height of a cone of greatest volume that can be inscribed in a sphere of radius R is kR, then ratio of the volume of the cone to the volume of the sphere is

(A) $8 : 27$
(B) $27 : 64$
(C) $8 : 125$
(D) $4 : 5$

Answer: (A) $8 : 27$ · The council's preliminary key

Q171 AP EAPCET 2023 · 18 May · Shift 1 MCQ

If the locus of the points on the curve $x^3y^2 + \frac{x^2}{y} = 5$ at which the tangent is parallel to X-axis is $f(x, y) = 0$, then the point that lies on this curve $f(x, y) = 0$ is

(A) $\left(2, \sqrt[3]{3}\right)$
(B) $\left(\sqrt[3]{2}, 3\right)$
(C) $\left(-2, \frac{1}{\sqrt[3]{3}}\right)$
(D) $\left(-\sqrt[3]{2}, \frac{1}{\sqrt[3]{3}}\right)$

Answer: (C) $\left(-2, \frac{1}{\sqrt[3]{3}}\right)$ · The council's preliminary key

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Q172 AP EAPCET 2023 · 18 May · Shift 1 MCQ

The area (in sq units) of the triangle formed by the normal drawn at the point $(1, 0)$ on the curve $x = e^{\sin y}$ with the coordinate axes is

(A) 1
(B) $\frac{1}{4}$
(C) $\frac{1}{2}$
(D) $\frac{3}{8}$

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

Q173 AP EAPCET 2023 · 18 May · Shift 1 MCQ

If the tangent drawn to the curve $(x^2 + 1)(y - 3) = x$ at a point P, lying in the first quadrant, is a horizontal line, then the equation of the normal at the point P is

(A) $x = \frac{7}{2}$
(B) $x = 1$
(C) $y = \frac{7}{2}$
(D) $y = 1$

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

Q174 AP EAPCET 2023 · 18 May · Shift 1 MCQ

The slope of the tangent at any point (x,y) on the curve, is equal to the product of the coordinates of that point. If the equation of the normal to the curve at the point $(\sqrt{2}, e)$ is ax+by=1, then $\frac{b}{a} =$

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

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

Q175 AP EAPCET 2023 · 18 May · Shift 1 MCQ

The curve represented by

$x = t^5 + 5t^3 + 20t + 7$ and $y = 4t^3 - 3t^2 - 18t + 3$ is decreasing in the interval

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

Answer: (C) $(-1,3/2)$ · The council's preliminary key

Q176 AP EAPCET 2023 · 18 May · Shift 2 MCQ

The locus of the point on the curve $y=\sin x$ where the tangent drawn at that point always passes through the point $(0,\pi)$ is

(A) $x=y-\pi$
(B) $\sin x+\cos y+1=0$
(C) $x^2(1-y^2)=(y-\pi)^2$
(D) $x^2+(y-\pi)^2=0$

Answer: (C) $x^2(1-y^2)=(y-\pi)^2$ · The council's preliminary key

Q177 AP EAPCET 2023 · 18 May · Shift 2 MCQ

If all the normals drawn to the curve $y=\frac{1+3x^2}{3+x^2}$ at the points of intersection of $y=\frac{1+3x^2}{3+x^2}$ and $y=1$ pass through the point (α,β), then $3\alpha+2\beta=$

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

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

Q178 AP EAPCET 2023 · 18 May · Shift 2 MCQ

The equation of the normal to the curve $y=\cosh x$ drawn at the point nearest to the origin is

(A) $y=0$
(B) $x=1$
(C) $x=0$
(D) $y=1$

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

Q179 AP EAPCET 2023 · 18 May · Shift 2 MCQ

Let $n\in(0,\infty)$. If all the curves $y=x^n\log x$ for distinct values of n, always have $y=x-1$ as the tangent drawn at a fixed point (α,β), then $\alpha+\beta=$

(A) 0
(B) $\log 2$
(C) 1
(D) $\log 3$

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

Q180 AP EAPCET 2023 · 17 May · Shift 1 MCQ

The ordinates of the points on the curve $y = \text{Tan}^{-1}(\sin\sqrt{x})$, $0 \le x \le 8\pi^2$, at which the tangent is parallel to X – axis are

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

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

Q181 AP EAPCET 2023 · 17 May · Shift 1 MCQ

The function $f(x) = x^2 + \frac{54}{x}$

(A) is increasing and has minimum value 27 in the interval $(0, \infty)$
(B) is decreasing and has neither maximum nor minimum in the interval $(-\infty, 0)$
(C) has maximum value 27 in the interval $(-\infty, \infty)$
(D) is increasing and has neither maximum nor minimum values in the interval $(-\infty, \infty)$

Answer: (B) is decreasing and has neither maximum nor minimum in the interval $(-\infty, 0)$ · The council's preliminary key

Q182 AP EAPCET 2023 · 17 May · Shift 1 MCQ

If $(a^2 - 1)x + ay + (3 - a) = 0$ is a normal to the curve $xy = 1$, then the interval in which 'a' lies is

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

Answer: (B) $(-\infty, -1] \cup (0, 1]$ · The council's preliminary key

Q183 AP EAPCET 2023 · 17 May · Shift 1 MCQ

The maximum value of x^4y^4 when $a^2x^4 + b^2y^4 = c^6$ is

(A) $\frac{c^{12}}{16a^4b^4}$
(B) $\frac{c^{12}}{4a^2b^2}$
(C) $\frac{c^6}{(a+b)^{12}}$
(D) $\frac{c^6}{a^4+b^4}$

Answer: (B) $\frac{c^{12}}{4a^2b^2}$ · The council's preliminary key

Q184 AP EAPCET 2023 · 17 May · Shift 2 MCQ

If θ is the angle made by the normal drawn to the curve $x = e^t \cos t,\ y = e^t \sin t$ at the point $(1, 0)$, with the X-axis, then $\theta =$

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

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

Q185 AP EAPCET 2023 · 17 May · Shift 2 MCQ

If a normal drawn at a point P to the curve $y = \sin x$ passes through the origin, then the locus of P is

(A) $x^2 = y^2 - y^4$
(B) $x + y = 1$
(C) $\frac{1}{y^2} - \frac{1}{x^2} = 1$
(D) $\frac{1}{y^4} + \frac{1}{x^4} = 1$

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

Q186 AP EAPCET 2023 · 17 May · Shift 2 MCQ

An extreme value of $f(x) = \frac{4}{\sin x} + \frac{1}{1-\sin x}$ in $(0, \pi/2)$ is

(A) 9
(B) 8
(C) $2/3$
(D) $-7/2$

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

Q187 AP EAPCET 2023 · 17 May · Shift 2 MCQ

If the tangent drawn to the curve $y = x^3$ at a point (α, β) cuts again the curve at another point (α_1, β_1), then $\frac{\beta_1}{\beta} =$

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(A) -2
(B) 1
(C) -8
(D) 27

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

Q188 AP EAPCET 2023 · 16 May · Shift 1 MCQ

If $f(x) = px^3 + qx^2 + rx + t$ attains local minimum and local maximum values at $x = -2$ and $x = 2$ respectively and p is a root of $9x^2 - 1 = 0$, then $p + q + r =$

(A) 4
(B) 3
(C) -5
(D) -8

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

Q189 AP EAPCET 2023 · 16 May · Shift 1 MCQ

If the tangent drawn at A(2,1) to the curve $x = 1 + \frac{1}{y^2}$ meets the curve again at B, then

(A) the tangent drawn at B coincides with the tangent drawn at A
(B) the angle between the tangents drawn at A and B is neither 0 nor $\frac{\pi}{2}$
(C) the tangent drawn at A and the tangent drawn at B are perpendicular to each other
(D) the tangent drawn at A is parallel to the tangent drawn at B

Answer: (B) the angle between the tangents drawn at A and B is neither 0 nor $\frac{\pi}{2}$ · The council's preliminary key

Q190 AP EAPCET 2023 · 16 May · Shift 1 MCQ

The points on the curve $y^2 = x + \sin x$ at which the normal is parallel to the Y-axis lie on

(A) a line parallel to Y-axis
(B) a circle with centre at origin
(C) a parabola
(D) a pair of lines bisecting the angle between the coordinate axes

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

Q191 AP EAPCET 2023 · 16 May · Shift 1 MCQ

Given that the solid obtained by rotating a rectangle about one of its side is a cylinder. If the perimeter of a rectangle is 48 cm and the volume of the cylinder formed by rotating it is maximum, then the dimensions of that rectangle is

(A) 14, 10
(B) 20, 4
(C) 18, 6
(D) 8, 16

Answer: (D) 8, 16 · The council's preliminary key

Q192 AP EAPCET 2023 · 16 May · Shift 2 MCQ

$f(x)$ is a continuous function on $\mathbb{R}$ and $y = f(x)$ is a curve. If (α, β) is a point such that $\beta = f(\alpha)$ and $p\alpha + m\beta + n = 0$ $(p \neq 0, m \neq 0)$, then which one of the following is True?

(A) When $p + mf'(\alpha) = 0$, $px + my + n = 0$ intersects the curve $y = f(x)$
(B) $px + my + n = 0$ is always a tangent to the curve $y = f(x)$
(C) When $p + mf'(\alpha) \neq 0$, $px + my + n = 0$ intersects the curve $y = f(x)$
(D) $px + my + n = 0$ is never a tangent to the curve $y = f(x)$

Answer: (C) When $p + mf'(\alpha) \neq 0$, $px + my + n = 0$ intersects the curve $y = f(x)$ · The council's preliminary key

Q193 AP EAPCET 2023 · 16 May · Shift 2 MCQ

The sum of the global minimum and global maximum values of the function $f(x) = \frac{4}{3}x^3 - 4x$ in $[0, 2]$ is

(A) 0
(B) $8/3$
(C) $-8/3$
(D) 1

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

Q194 AP EAPCET 2023 · 16 May · Shift 2 MCQ

If the slope of the tangent on a curve at any point (x,y) is equal to $\frac{y^2 - x^2}{2xy}$, then the equation of the normal at the point $\left(\frac{1}{2}, \frac{\sqrt{3}}{2}\right)$ is

(A) $\sqrt{3}x + y = \sqrt{3}$
(B) $x + \sqrt{3}y = \sqrt{3}$
(C) $3x - \sqrt{3}y = 0$
(D) $x + \sqrt{3}y = 0$

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

Q195 AP EAPCET 2023 · 16 May · Shift 2 MCQ

$A(1,15)$, $B(3,-12)$, $C(6,12)$ are three consecutive turning points of a continuous curve $y=f(x)$. If $f(x)=0$ only for $x=\alpha$ and $x=\beta$, then $|\beta-\alpha|<$

(A) 27
(B) 2
(C) 5
(D) 24

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

Q196 AP EAPCET 2023 · 15 May · Shift 1 MCQ

If $f(x)=\sqrt{x+\sin x}$, then all the points of the set $\{(x,f(x))/f'(x)=0\}$ lie on

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

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

Q197 AP EAPCET 2023 · 15 May · Shift 1 MCQ

If the tangent drawn to the curve $y=x^3-ax^2+x+1$ at each point $x\in\mathbb{R}$, is inclined at an acute angle with the positive direction of X – axis, then the set of all possible values of 'a' is

(A) $\mathbb{R}-(-\sqrt{3},\sqrt{3})$
(B) $[-3,3]$
(C) $\mathbb{R}$
(D) $(-\sqrt{3},\sqrt{3})$

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

Q198 AP EAPCET 2023 · 15 May · Shift 1 MCQ

The number of points on the curve $y=2t^2+3t-5$ and $x=t^3-4t^2-3t$ such that the normals drawn at them on the curve are parallel to X – axis is

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

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

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Q199 AP EAPCET 2023 · 15 May · Shift 1 MCQ

If $A = \{x/9x \geq x^2 + 20\}$ and $f : A \to R$ is defined by $f(x) = 2x^3 - 15x^2 + 36x - 48$, then the maximum value of $f(x)$ is

(A) -20
(B) 7
(C) 20
(D) -16

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

Q200 AP EAPCET 2023 · 15 May · Shift 2 MCQ

If the angle between the curves $y = e^{2(1+x)-4}$ and $x^2y = 1$ at the point $(1, 1)$ is θ, then $|\sin\theta| + |\cos\theta| =$

(A) $7/5$
(B) $3/5$
(C) $8/7$
(D) $6/5$

Answer: (A) $7/5$ · The council's preliminary key

Q201 AP EAPCET 2023 · 15 May · Shift 2 MCQ

If a line is moving between the coordinate axes such that the sum of the intercepts made by it on the coordinate axes is always 12, then the equation of that line which forms a triangle of maximum area with the coordinate axes is

(A) $3x + y = 9$
(B) $5x + 7y = 35$
(C) $x + y = 6$
(D) $5x + y = 10$

Answer: (C) $x + y = 6$ · The council's preliminary key

Q202 AP EAPCET 2023 · 15 May · Shift 2 MCQ

If $(2, a)$ and $(b, 19)$ are two stationary points of the curve $y = 2x^3 - 15x^2 + 36x + c$, then $a + b + c =$

(A) -20
(B) 15
(C) -12
(D) 24

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

Q203 AP EAPCET 2023 · 15 May · Shift 2 MCQ

If the points of contact of the tangents drawn from $(0,0)$ to the curve $y = x^2 + 3x + 4$ are (α, β) and (γ, δ), then $\beta + \delta =$

(A) 7
(B) 25
(C) 16
(D) 13

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

Q204 TS EAMCET 2023 · 14 May · Shift 1 MCQ

If a line having slope 2 is a tangent to the curve $y = x^4 - 6x^3 + 13x^2 - 12x + 5$ at points $P(x_1, y_1)$ and $Q(x_2, y_2)$, $x_1, x_2 \in N$ then $x_1x_2 - y_1y_2 =$

(A) 17
(B) 3
(C) -17
(D) -13

Answer: (D) -13 · The council's preliminary key

Q205 TS EAMCET 2023 · 14 May · Shift 1 MCQ

Let m be the slope of the normal L drawn at $(1,2)$ to the curve $x = t^2 - 7t + 7$, $y = t^2 - 4t - 10$ and $ax + by + c = 0$ be the equation of the normal L. If G.C.D. of (a, b, c) is 1, then $m(a + b + c) =$

(A) 8
(B) $\frac{-64}{5}$
(C) -8
(D) 5

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

Q206 TS EAMCET 2023 · 14 May · Shift 1 MCQ

If the function $f(x) = xe^{-x}, x \in \mathbb{R}$ attains its maximum value β at $x = \alpha$ then $(\alpha, \beta) =$

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

Answer: (B) $\left(1, \frac{1}{e}\right)$ · The council's preliminary key

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Q207 TS EAMCET 2023 · 14 May · Shift 2 MCQ

A ladder of length 13 mts has one end resting against a vertical wall and the other on the ground. If the lower end moves away from the wall at a speed of 2 mts/minute, then the speed (in mts/min) at which upper end falls when the bottom is 5 mts away from the wall is

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

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

Q208 TS EAMCET 2023 · 14 May · Shift 2 MCQ

An angle between the curves $x^2 - y^2 = 4$ and $x^2 + y^2 = 4\sqrt{2}$ is

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

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

Q209 TS EAMCET 2023 · 14 May · Shift 2 MCQ

The maximum volume (in cu. units) of the cylinder which can be inscribed in a sphere of radius 12 units is

(A) $384\sqrt{3}\,\pi$
(B) $768\sqrt{3}\,\pi$
(C) $\frac{768\pi}{\sqrt{3}}$
(D) $\frac{1152\pi}{\sqrt{3}}$

Answer: (B) $768\sqrt{3}\,\pi$ · The council's preliminary key

Q210 TS EAMCET 2023 · 13 May · Shift 1 MCQ

The nearest approximate value of $\sqrt{2023}$ is

(A) $(6.6)^2$
(B) 44.9778
(C) $(6.8)^2$
(D) 44.7777

Answer: (B) 44.9778 · The council's preliminary key

Q211 TS EAMCET 2023 · 13 May · Shift 1 MCQ

The slope of the normal drawn at a point P to the curve $y = x^3 - 10x^2 + 31x - 30$ is $-\frac{1}{14}$.

If the coordinates of P are integers, then the X-intercept of the tangent drawn at P to the given curve is

(A) $\frac{-11}{7}$
(B) 22
(C) $\frac{11}{7}$
(D) -22

Answer: (C) $\frac{11}{7}$ · The council's preliminary key

Q212 TS EAMCET 2023 · 13 May · Shift 1 MCQ

x and y are two positive integers such that $2x + 3y = 50$. If x^2y^3 is maximum for $x = \alpha$ and $y = \beta$, then $\frac{\alpha}{2} + \frac{\beta}{5} =$

(A) 10
(B) $\frac{10}{3}$
(C) 5
(D) 7

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

Q213 TS EAMCET 2023 · 13 May · Shift 2 MCQ

The diameter of a sphere is measured as 42 cm. If there is an error of $1/77$ cm in measuring it, then the error involved in the volume of that sphere (in cubic centimeters) is

(A) 33
(B) $\frac{24}{7}$
(C) 36
(D) $\frac{36}{7}$

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

Q214 TS EAMCET 2023 · 13 May · Shift 2 MCQ

For $h, k \in N$, let $P(h, k)$ be the point of intersection of the curves $x^2y - x^3 = 8$ and $y^3 - xy^2 = 32$. If θ is the acute angle between these two curves at P, then $\tan\theta =$

(A) $\frac{27}{11}$
(B) $\frac{1}{3}$
(C) $\frac{\pi}{2}$
(D) 3

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

Q215 TS EAMCET 2023 · 13 May · Shift 2 MCQ

If the absolute maximum and absolute minimum values of the function $f(x) = x^3 - 2x^2 + x - 3$ defined on $[0, 2]$ are M and m respectively, then $M + m =$

(A) -4
(B) $\frac{-104}{27}$
(C) 2
(D) -2

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

Q216 TS EAMCET 2023 · 13 May · Shift 2 MCQ

If the slope of the tangent drawn at any point (x, y) to the curve $y = f(x)$ is $3x^2 - 5$ and $f(1) = 2$, then the tangent at $(1, 2)$ to the curve $y = f(x)$ intersects the curve at the point

(A) $(2, 0)$
(B) $(-2, 8)$
(C) $(3, -2)$
(D) $(-1, 6)$

Answer: (B) $(-2, 8)$ · The council's preliminary key

Q217 TS EAMCET 2023 · 12 May · Shift 1 MCQ

The equation of the normal at $t = \frac{\pi}{2}$ to the curve $x = 2\sin t, y = 2\cos t$ is

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

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

Q218 TS EAMCET 2023 · 12 May · Shift 1 MCQ

If the function $f(x) = \frac{x}{5} + \frac{5}{x}$, $(x \neq 0)$ attains its relative maximum value at $x = \alpha$ then $\sqrt{\alpha^2 + 2\alpha - 6} =$

(A) 10
(B) 6
(C) 5
(D) 3

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

Q219 TS EAMCET 2023 · 12 May · Shift 1 MCQ

If the slope of the tangent drawn to the curve $y = e^{a+bx^2}$ at the point $P(1, 1)$ is -2, then the value of $2a - 3b$ is

(A) 5
(B) 6
(C) 7
(D) 8

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

Q220 TS EAMCET 2023 · 12 May · Shift 2 MCQ

Electric current (I) is measured by galvanometer, the current being proportional to the tangent of the angle (θ) of deflection. If the deflection is read as 45° and an error of 1% is made in reading it, the percentage error in the current is

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

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

Q221 TS EAMCET 2023 · 12 May · Shift 2 MCQ

If the equation of a tangent drawn to the curve $y = \cos(x + y)$, $-1 \leq x \leq 1 + \pi$ is $x + 2y = k$, then $k =$

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

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

Q222 TS EAMCET 2022 · 20 Jul · Shift 1 MCQ

The approximate value of $\sqrt[3]{28}$ rounded up to 3 decimal places is

(A) 3.012
(B) 3.037
(C) 3.025
(D) 3.033

Answer: (B) 3.037 · The council's preliminary key

Q223 TS EAMCET 2022 · 20 Jul · Shift 1 MCQ

$y = x^2$ is the given curve. Imagine that this curve is dragged along the positive X-axis to a distance 'a' units. If the acute angle between the curves at two positions is θ then

(A) $\theta = \frac{\pi}{2}$
(B) $\tan\theta = \frac{2|a|}{|1-a^2|}$
(C) $\cos\theta = \frac{2|a|}{|1-a^2|}$
(D) $\theta = 0$

Answer: (B) $\tan\theta = \frac{2|a|}{|1-a^2|}$ · The council's preliminary key

Q224 TS EAMCET 2022 · 20 Jul · Shift 1 MCQ

If x and y are two positive integers such that $x + 2y = 10$ and x^2y^3 is maximum then $x^2 + 2y^3 =$

(A) 34
(B) 137
(C) 43
(D) 70

Answer: (D) 70 · The council's preliminary key

Q225 TS EAMCET 2022 · 20 Jul · Shift 2 MCQ

The equation of the tangent to the curve $x^2 + y - 7 = 4x$ at the point $(1, 10)$ is

(A) $y = 2x + 8$
(B) $y = x + 8$
(C) $y = -2x - 14$
(D) $y = x - 4$

Answer: (A) $y = 2x + 8$ · The council's preliminary key

Q226 TS EAMCET 2022 · 20 Jul · Shift 2 MCQ

If θ is the angle between the curves $x^2 - y^2 = 4$ and $y^2 = 3x$ then $\tan\theta =$

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(A) $\frac{5}{3\sqrt{3}}$
(B) $\frac{5}{6\sqrt{3}}$
(C) $\frac{5}{18}$
(D) $\frac{5}{6}$

Answer: (B) $\frac{5}{6\sqrt{3}}$ · The council's preliminary key

Q227 TS EAMCET 2022 · 20 Jul · Shift 2 MCQ

The absolute maximum value of the function $f(x) = 2x^3 - 3x^2 - 36x + 9$ defined on $[-3, 3]$ is

(A) 36
(B) 53
(C) 63
(D) 72

Answer: (B) 53 · The council's preliminary key

Q228 TS EAMCET 2022 · 19 Jul · Shift 1 MCQ

The equation of the normal to the curve $4x^2 + 9y^2 = 36$ at the point $P\left(\frac{7\pi}{4}\right)$ is

(A) $2x - 3y - 6\sqrt{2} = 0$
(B) $2x + 3y = 0$
(C) $3\sqrt{2}\,x + 2\sqrt{2}\,y - 5 = 0$
(D) $3\sqrt{2}\,x - 2\sqrt{2}\,y - 13 = 0$

Answer: (C) $3\sqrt{2}\,x + 2\sqrt{2}\,y - 5 = 0$ · The council's preliminary key

Q229 TS EAMCET 2022 · 19 Jul · Shift 1 MCQ

If θ is the acute angle between the curves $x^2 + y^2 = 4$ and $y^2 = 3x$ then $\tan\theta =$

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

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

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Q230 TS EAMCET 2022 · 19 Jul · Shift 1 MCQ

Let $\sqrt{3}$ be the radius and $\frac{\pi}{3}$ be the semivertical angle of the given cone. Then the height of the right circular cylinder of maximum volume that can be inscribed in the given cone is

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

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

Q231 TS EAMCET 2022 · 19 Jul · Shift 2 MCQ

The equation of the normal to the curve $\sin y = \sqrt{3}x \sin\left(\frac{\pi}{6} + y\right)$ at $x = 0$, is

(A) $2x + \sqrt{3}y = 0$
(B) $2x + y = 0$
(C) $x + 2y = 0$
(D) $\sqrt{3}x + 2y = 0$

Answer: (A) $2x + \sqrt{3}y = 0$ · The council's preliminary key

Q232 TS EAMCET 2022 · 19 Jul · Shift 2 MCQ

Assertion (A) : The curves $y^2 = 4x$ and $x^2 = -2y$ intersect at $(1, 2)$ orthogonally.
Reason (R) : If the product of the slopes of the tangents drawn to two curves at their point of intersection is -1, then the curves are said to cut each other orthogonally
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

Q233 TS EAMCET 2022 · 19 Jul · Shift 2 MCQ

Let $f(x) = \begin{cases} 1 + 6x - 3x^2, & x \leq 1 \\ x + \log_2\left(b^2 + 7\right), & x > 1 \end{cases}$. Then the set of all possible values of b such that $f(1)$ is the maximum value of $f(x)$ is

(A) $[-1, 1]$
(B) $[0, 1]$
(C) $[0, 2]$
(D) $[-1, 0]$

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

Q234 TS EAMCET 2022 · 18 Jul · Shift 1 MCQ

The area of the triangle formed by the tangent and the normal drawn to the curve $y^2 = 4x$ at $(1, 2)$ with Y-axis is (in square units)

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

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

Q235 TS EAMCET 2022 · 18 Jul · Shift 1 MCQ

Consider two families of curves $y^2 = 4ax$ (a is a parameter) and $x^2 + \frac{y^2}{2} = c^2$ (c is parameter). If one curve from each family is chosen, then the angle between those two curves is

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

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

Q236 TS EAMCET 2022 · 18 Jul · Shift 1 MCQ

Let a function $f(x)$ be continuous in an interval $[a, b]$. Let $\delta > 0$ be a very small real number. Let $c \in (a, b)$ be such that $f(c - \delta) < f(c)$ and $f(c + \delta) < f(c)$ for every $\delta > 0$. Let $(f(\alpha - \delta) - f(\alpha))(f(\alpha + \delta) - f(\alpha)) < 0 \ \forall \alpha \in (a, b)$ and $\alpha \neq c$. Then

(A) $f(x)$ has a local maximum at c and a local minimum at α
(B) $f(x)$ has a local maximum at α and a local minimum at c
(C) $f(x)$ has only one local maximum at c
(D) $f(x)$ has only one local minimum at c

Answer: (C) $f(x)$ has only one local maximum at c · The council's preliminary key

Q237 TS EAMCET 2022 · 18 Jul · Shift 2 MCQ

If an error of 0.02 sq.cm is found in the surface area of a sphere when its radius is measured as 10 cm, then the approximate error that occurs in the volume of the sphere, in cubic centimetres, is

(A) 0.2
(B) 0.01
(C) 0.3
(D) 0.1

Answer: (D) 0.1 · The council's preliminary key

Q238 TS EAMCET 2022 · 18 Jul · Shift 2 MCQ

If θ is the angle between the curves $y^2 = 4x$ and $x^2 + y^2 = 5$ then $|\tan\theta| =$

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

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

Q239 TS EAMCET 2022 · 18 Jul · Shift 2 MCQ

The local maximum value of the function $f(x) = -(x-2)^3(x+2)^2$ is

(A) 0
(B) $\frac{12^3 \cdot 8^2}{5^5}$
(C) 125
(D) $\frac{2^9 \cdot 3^2}{5^6}$

Answer: (B) $\frac{12^3 \cdot 8^2}{5^5}$ · The council's preliminary key

Q240 AP EAPCET 2022 · 8 Jul · Shift 1 MCQ

The sum of the intercepts made by a tangent drawn to the curve $\left(\frac{x}{a}\right)^n + \left(\frac{y}{b}\right)^n = 2$ at (a, b) on the coordinate axes is

(A) $a + b$
(B) $a^2 + b^2$
(C) $2(a - b)$
(D) $2(a + b)$

Answer: (D) $2(a+b)$ · The council's preliminary key

Q241 AP EAPCET 2022 · 8 Jul · Shift 1 MCQ

The angle between the curve $2y = e^{-x/2}$ and the y-axis is $\tan^{-1}(k)$ then $k =$

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

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

Q242 AP EAPCET 2022 · 8 Jul · Shift 1 MCQ

Maximum area of the rectangle inscribed in a circle of radius 10 cms is

(A) 100
(B) 200
(C) 250
(D) 150

Answer: (B) 200 · The council's preliminary key

Q243 AP EAPCET 2022 · 8 Jul · Shift 1 MCQ

At $x = 0$, $f(x) = \cos x - 1 + \frac{x^2}{2} - \frac{x^3}{3}$

(A) has a minimum value
(B) has a maximum value
(C) has no extremum value
(D) is not defined

Answer: (C) has no extremum value · The council's preliminary key

Q244 AP EAPCET 2022 · 8 Jul · Shift 1 MCQ

The minimum value of $\left(1 + \frac{1}{\sin^n \alpha}\right)\left(1 + \frac{1}{\cos^n \alpha}\right)$ is

(A) 1
(B) 2
(C) $(1 + 2^n)^2$
(D) $\left(1 + 2^{n/2}\right)^2$

Answer: (D) $\left(1 + 2^{n/2}\right)^2$ · The council's preliminary key

Q245 AP EAPCET 2022 · 8 Jul · Shift 2 MCQ

The angle made by the tangent at $\theta = \pi/3$ on the curve $x = a(\theta + \sin\theta)$, $y = a(1 - \cos\theta)$ with x - axis is

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

Answer: (B) $\pi/6$ · Checked by our team

Q246 AP EAPCET 2022 · 8 Jul · Shift 2 MCQ

If the angle between the curves $y^2 = 4x$ and $y = e^{-x/2}$ is θ, then $\text{cosec}^2(\theta/2) =$

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

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

Q247 AP EAPCET 2022 · 8 Jul · Shift 2 MCQ

If $0 < x < \pi/2$, then

(A) $\frac{2}{\pi} > \frac{\sin x}{x}$
(B) $\frac{2}{\pi} < \frac{\sin x}{x}$
(C) $\frac{\sin x}{x} > 1$
(D) $2 < \frac{\sin x}{x}$

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

Q248 AP EAPCET 2022 · 8 Jul · Shift 2 MCQ

If $f(x) = \sqrt{3}\sin x - \cos x - 2ax + b$ decreases for all values of x, then

(A) $a \geq 1$
(B) $a = 1$
(C) $a \leq 1$
(D) $a < 1$

Answer: (A) $a \geq 1$ · The council's preliminary key

Q249 AP EAPCET 2022 · 7 Jul · Shift 1 MCQ

Let $f(x) = x^2 + 1/x^2$ and $g(x) = x - 1/x$ for $x \in \mathbf{R} - \{-1, 0, +1\}$ then, the local minimum of $\frac{f(x)}{g(x)}$ is

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

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

Q250 AP EAPCET 2022 · 7 Jul · Shift 1 MCQ

The curve $y = ax^3 + bx^2 + cx + 5$ touches x-axis at $P(-2, 0)$, then $c =$

(A) $4a + 5$
(B) $4a - 5$
(C) $5 - 4a$
(D) 0

Answer: (A) $4a + 5$ · The council's preliminary key

Q251 AP EAPCET 2022 · 7 Jul · Shift 1 MCQ

The curves $y = x^2 - 1$, $y = 8x - x^2 - 9$

(A) intersect at right angles at $(2, 3)$
(B) touch each other at $(2, 3)$
(C) intersect at 45^0
(D) intersect at 60^0

Answer: (B) touch each other at $(2, 3)$ · The council's preliminary key

Q252 AP EAPCET 2022 · 7 Jul · Shift 1 MCQ

The perimeter of a sector is constant. If its area is to be maximum, the sectorical angle should be

(A) $\frac{\pi^c}{6}$
(B) $\frac{\pi^c}{4}$
(C) 4^c
(D) 2^c

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

Q253 AP EAPCET 2022 · 7 Jul · Shift 1 MCQ

The set of all x for which $\sin x \leq x$ is

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

Answer: (A) $\left(0, \frac{\pi}{2}\right)$ · The council's preliminary key

Q254 AP EAPCET 2022 · 7 Jul · Shift 1 MCQ

The function $f(x) = 2x^3 - 9ax^2 + 12a^2x + 1$ $(a > 0)$ attains its maximum and minimum at p and q respectively and $p^2 = q$. Then $a =$

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

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

Q255 AP EAPCET 2022 · 7 Jul · Shift 2 MCQ

Equation of tangent to the curve $y = x + \frac{4}{x^2}$ which is parallel to x-axis is

(A) $y = 8$
(B) $y = 0$
(C) $y = 3$
(D) $y = 2$

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

Q256 AP EAPCET 2022 · 7 Jul · Shift 2 MCQ

The normal to the curve y = f(x) at the points (3, 4) makes an angle $\frac{3\pi}{4}$ with positive x-axis then $f'(3) =$

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

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

Q257 AP EAPCET 2022 · 7 Jul · Shift 2 MCQ

The minimum distance of a point on the curve $y = x^2 - 4$ from the origin is

(A) $\frac{\sqrt{15}}{2}$
(B) $\frac{\sqrt{19}}{2}$
(C) $\sqrt{\frac{15}{2}}$
(D) $\sqrt{\frac{19}{2}}$

Answer: (A) $\frac{\sqrt{15}}{2}$ · The council's preliminary key

Q258 AP EAPCET 2022 · 7 Jul · Shift 2 MCQ

If an open cylinder of given surface area has maximum volume then its radius is

(A) Height of the cylinder
(B) Height of the cylinder / 2
(C) 2 times Height of the cylinder
(D) 3 times Height of the cylinder

Answer: (A) Height of the cylinder · The council's preliminary key

Q259 AP EAPCET 2022 · 7 Jul · Shift 2 MCQ

If $x + y = k$, $x > 0$, $y > 0$ then $x^2 + y^2$ is minimum, if

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

Answer: (C) $x = y$ · The council's preliminary key

Q260 AP EAPCET 2022 · 6 Jul · Shift 1 MCQ

m is the slope of a tangent to the curve $e^y = 1 + x^2$ at $x = 1$ then $m =$

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

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

Q261 AP EAPCET 2022 · 6 Jul · Shift 1 MCQ

V is the set of points on the curve $y^3 - 3xy + 2 = 0$ where the tangent is vertical then $V =$

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(A) Φ
(B) $\{(1,0)\}$
(C) $\{(1,1)\}$
(D) $\{(0,0)\ (1,1)\}$

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

Q262 AP EAPCET 2022 · 6 Jul · Shift 1 MCQ

The equation of tangent of the curve $y=\sqrt{9-2x^2}$ at the point where the ordinate and abscissa are equal is

(A) $2x+y-3\sqrt{3}=0$
(B) $2x+y+3\sqrt{3}=0$
(C) $2x-y-3\sqrt{3}=0$
(D) $2x-y+3\sqrt{3}=0$

Answer: (A) $2x+y-3\sqrt{3}=0$ · The council's preliminary key

Q263 AP EAPCET 2022 · 6 Jul · Shift 1 MCQ

The maximum area of a right angled triangle with hypotenuse h is

(A) $h^2/2\sqrt{2}$
(B) $h^2/2$
(C) $h^2/\sqrt{2}$
(D) $h^2/4$

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

Q264 AP EAPCET 2022 · 6 Jul · Shift 1 MCQ

The value of 'a' for which the function $f(x)=a\sin x+\frac{1}{3}\sin 3x$ has an extremum value at $x=\frac{\pi}{3}$ is

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

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

Q265 AP EAPCET 2022 · 6 Jul · Shift 2 MCQ

The angle between the tangents drawn at (0, 0) to the curves $y^3-x^2y+5y-2x=0$ and $x^4-x^3y^2+5x+2y=0$ is

(A) $\pi/6$
(B) $\pi/4$
(C) $\pi/3$
(D) $\pi/2$

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

Q266 AP EAPCET 2022 · 6 Jul · Shift 2 MCQ

The normal to the curve $x = a(1 + \cos\theta)$, $y = a\sin\theta$ at θ always passes through a fixed point, then the fixed point is

(A) $(a, 0)$
(B) $(0, a)$
(C) $(0, 0)$
(D) (a, a)

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

Q267 AP EAPCET 2022 · 6 Jul · Shift 2 MCQ

Two sides of a triangle are given. If the area of the triangle is maximum then the angle between the given sides is

(A) 45^0
(B) 30^0
(C) 60^0
(D) 90^0

Answer: (D) 90^0 · The council's preliminary key

Q268 AP EAPCET 2022 · 6 Jul · Shift 2 MCQ

For a particle moving on a straight line it is observed that the distance 'S' at a time 't' is given by $S = 6t - \frac{t^3}{2}$. The maximum velocity during the motion is

(A) 3
(B) 6
(C) 9
(D) 12

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

Q269 AP EAPCET 2022 · 5 Jul · Shift 1 MCQ

If the normal drawn at a print (sic) P on the curve $3y = 6x - 5x^3$ passes through $(0, 0)$ then the positive integral value of the abscissa of the point P is

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

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

Q270 AP EAPCET 2022 · 5 Jul · Shift 1 MCQ

The line joining the points $(0, 3)$ and $(5, -2)$ is a tangent to the curve $y = \frac{C}{x+1}$ then $C =$

(A) 1
(B) -2
(C) 4
(D) 5

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

Q271 AP EAPCET 2022 · 5 Jul · Shift 1 MCQ

$y = x^3 - ax^2 + 48x + 7$ is an increasing function for all real values of x, then a lies in the interval

(A) $(-14, 14)$
(B) $(-12, 12)$
(C) $(-16, 16)$
(D) $(-21, -21)$

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

Q272 AP EAPCET 2022 · 5 Jul · Shift 1 MCQ

If $a, b > 0$ then, minimum value of $y = \frac{b^2}{a-x} + \frac{a^2}{x}$, $0 < x < a$ is

(A) $4a$
(B) $4b$
(C) $2a$
(D) $2b$

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

Q273 AP EAPCET 2022 · 5 Jul · Shift 1 MCQ

The point on the curve $y = x^2 + 4x + 3$ which is closest to the line $y = 3x + 2$ is

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(A) $\left(\frac{1}{2}, \frac{5}{4}\right)$
(B) $\left(\frac{-1}{2}, \frac{5}{4}\right)$
(C) $\left(2, \frac{-5}{3}\right)$
(D) $\left(2, \frac{5}{3}\right)$

Answer: (B) $\left(\frac{-1}{2}, \frac{5}{4}\right)$ · The council's preliminary key

Q274 AP EAPCET 2022 · 5 Jul · Shift 2 MCQ

If the two curves $y = a^x$ and $y = b^x$ intersect at angle α, then $\tan\alpha =$

(A) $\frac{\log a - \log b}{1 + \log a \log b}$
(B) $\frac{\log a + \log b}{1 - \log a \log b}$
(C) $\frac{\pi}{4}$
(D) $\frac{\pi}{2}$

Answer: (A) $\frac{\log a - \log b}{1 + \log a \log b}$ · The council's preliminary key

Q275 AP EAPCET 2022 · 5 Jul · Shift 2 MCQ

The area of the triangle formed by the tangent to the curve $xy = a^2$ at (x_1, y_1) on it and the axes is

(A) a^2 sq. units
(B) $\frac{3a^2}{2}$ sq. units
(C) $2a^2$ sq. units
(D) $4a^2$ sq. units

Answer: (C) $2a^2$ **sq. units** · The council's preliminary key

Q276 AP EAPCET 2022 · 5 Jul · Shift 2 MCQ

If the slope of the line through $(0, 0)$ which is tangent to the curve $y = x^2 + x + 16$ is m, then the value of $m - 4$ is

(A) 9
(B) 10
(C) 12
(D) 13

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

Q277 AP EAPCET 2022 · 5 Jul · Shift 2 MCQ

In the interval $(7, \infty)$, $f(x) = |x - 5| + 2|x - 7|$ is

(A) increasing function
(B) decreasing function
(C) constant function
(D) attains maximum value

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

Q278 AP EAPCET 2022 · 5 Jul · Shift 2 MCQ

If the line $ax + by + c = 0$ is a normal to the curve $xy = 1$, then

(A) $a > 0, b > 0$
(B) $a > 0, b < 0$
(C) $a > 0, b = 0$
(D) $a < 0, b < 0$

Answer: (B) $a > 0, b < 0$ · The council's preliminary key

Q279 AP EAPCET 2022 · 4 Jul · Shift 1 MCQ

If the curves $y = x^3 - 3x^2 - 8x - 4$ and $y = 3x^2 + 7x + 4$ touch each other at a point P then the equation of common tangent at P is

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

Answer: (A) x - y + 1 = 0 · The council's preliminary key

Q280 AP EAPCET 2022 · 4 Jul · Shift 1 MCQ

The maximum value of $f(x) = \dfrac{x}{1 + 4x + x^2}$ is

(A) 1/4
(B) 1/5
(C) 1/6
(D) 1/7

Answer: (C) 1/6 · The council's preliminary key

Q281 AP EAPCET 2022 · 4 Jul · Shift 1 MCQ

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

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

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

Q282 AP EAPCET 2022 · 4 Jul · Shift 1 MCQ

The condition that $f(x) = ax^3 + bx^2 + cx + d$ has no extreme value is

(A) $b^2 - 4ac$
(B) $b^2 = 3ac$
(C) $b^2 < 3ac$
(D) $b^2 > 3ac$

Answer: (C) $b^2 < 3ac$ · The council's preliminary key

Q283 AP EAPCET 2022 · 4 Jul · Shift 2 MCQ

The number of those tangents to the curve $y^2 - 2x^3 - 4y + 8 = 0$ which pass through the point (1, 2) is

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

Answer: (B) 2 · Checked by our team

Q284 AP EAPCET 2022 · 4 Jul · Shift 2 MCQ

If the straight line $x\cos\alpha + y\sin\alpha = p$ touches the curve $\left(\frac{x}{a}\right)^n + \left(\frac{y}{b}\right)^n = 2$ at the point (a, b) on it and $\frac{1}{a^2} + \frac{1}{b^2} = \frac{k}{p^2}$ then k =

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

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

Q285 AP EAPCET 2022 · 4 Jul · Shift 2 MCQ

Condition that 2 curves $y^2 = 4ax$, $xy = c^2$ cut orthogonally is

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(A) $c^2 = 16a^2$
(B) $c^2 = 32a^2$
(C) $c^4 = 16a^4$
(D) $c^4 = 32a^4$

Answer: (D) $c^4 = 32a^4$ · The council's preliminary key

Q286 AP EAPCET 2022 · 4 Jul · Shift 2 MCQ

A closed cylinder of given volume will have least surface area when the ratio of its height and base radius is

(A) $2:1$
(B) $1:2$
(C) $2:3$
(D) $3:2$

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

Q287 AP EAPCET 2022 · 4 Jul · Shift 2 MCQ

Two particles P and Q located at the points $P(t, t^3 - 16t - 3)$, $Q(t+1, t^3 - 6t - 6)$ are moving in a plane, the minimum distance between the points in their motion is

(A) 1
(B) 5
(C) 169
(D) 49

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

Q288 AP EAPCET 2021 · 5 Oct · Shift 1 MCQ

A window is in the shape of a rectangle, with a semi-circle fused to one of its sides, as shown in the figure. If the perimeter of the window is fixed as 20 units, then its maximum area can be _____ sq. units.

(see the figure above)

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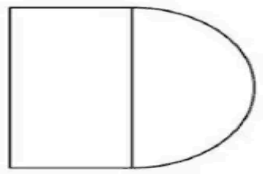
Mandatory : No

A window is in the shape of a rectangle, with a semi-circle fused to one of its sides, as shown in the figure. If the perimeter of the window is fixed as 20 $units$, then its maximum area can be _____ sq. units.



పటంలో చూపిన విధంగా ఒక దీర్ఘచతుర్భుజము యొక్క ఒక భుజానికి ఒక అర్ధవృత్తాకారాన్ని జతచేసినట్టుగా ఒక కిటికీ ఆకారము ఉన్నది. ఆ కిటికీ యొక్క చుట్టుకొలత 20 యూనిట్లగా నిర్ధారించినట్లయితే, అది పొందగల గరిష్ఠ వైశాల్యము _____ చ॥ యూనిట్లు.

Options :

1. $\frac{400}{\pi+4}$
2. $\frac{20}{\pi+4}$
3. $\frac{100}{\pi+4}$
4. $\frac{200}{\pi+4}$

(A) $\frac{400}{\pi+4}$
(B) $\frac{20}{\pi+4}$
(C) $\frac{100}{\pi+4}$
(D) $\frac{200}{\pi+4}$

Answer: (D) $\frac{200}{\pi+4}$ · The council's preliminary key

Q289 AP EAPCET 2021 · 5 Oct · Shift 1 MCQ

From a rectangular sheet having dimensions $30\ cm \times 80\ cm$, four equal squares of side $x\ cm$ are cut at each corner. The remaining sides of the rectangle are folded up vertically so as to form an open rectangular box. Find the value of 'x' for which the volume of the box formed is maximum.

(A) $x = 30\ cm$
(B) $x = 20\ cm$
(C) $x = \frac{20}{3}\ cm$
(D) $x = 15\ cm$

Answer: (C) $x = \frac{20}{3}\ cm$ · The council's preliminary key

Q290 AP EAPCET 2021 · 5 Oct · Shift 1 MCQ

A ladder $5\,m$ long is leaning against a wall. If the top of the ladder slides downwards at a rate of $10\ cm.sec^{-1}$, then the rate at which the angle between the floor and the ladder decreases, when the lower end of ladder is $2\,m$ from the wall, is _____ $radian.sec^{-1}$

(A) $\frac{1}{10}$
(B) $\frac{1}{20}$
(C) 20
(D) 10

Answer: (B) $\frac{1}{20}$ · The council's preliminary key

Q291 AP EAPCET 2021 · 25 Aug · Shift 1 MCQ

If two curves $x = y^2$, $xy = a^3$ cut each other orthogonally at a point, then $a^2 =$ _____

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

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

Q292 AP EAPCET 2021 · 25 Aug · Shift 1 MCQ

A particle moves along a straight line according to the law $s = \frac{1}{3}t^3 - 3t^2 + 9t + 17$, where 's' is in meter and 't' is in second. Its velocity decreases in _____

(A) $0 < t < 5$
(B) $0 < t < 3$
(C) $t > 5$
(D) $t > 3$

Answer: (B) $0 < t < 3$ · The council's preliminary key

Q293 AP EAPCET 2021 · 25 Aug · Shift 1 MCQ

Find the absolute maximum of $x^{40} - x^{20}$ on the interval $[0, 1]$.

(A) $\frac{-1}{4}$
(B) 0
(C) $\frac{1}{4}$
(D) $\frac{1}{2}$

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

Q294 AP EAPCET 2021 · 25 Aug · Shift 1 MCQ

The maximum area of a rectangle that can be formed with a fixed perimeter of 20 units is _____ sq. units

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(A) 30
(B) 25
(C) 20
(D) 15

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

Q295 AP EAPCET 2021 · 25 Aug · Shift 1 MCQ

If $f(x) = x^5 - 5x^4 + 5x^3 - 10$ has its local maxima and minima at $x = a$ and $x = b$ respectively, then $2a + b =$

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

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

Q296 AP EAPCET 2021 · 25 Aug · Shift 2 MCQ

If $s = 60t - 5t^2$ denotes the distance covered by a particle in time 't', then the distance it covers before coming to rest is _____ units.

(A) 120
(B) 720
(C) 240
(D) 180

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

Q297 AP EAPCET 2021 · 25 Aug · Shift 2 MCQ

If $y = 5x^2 + 6x + 6$, $x = 2$ and $\Delta x = 0.001$, then the values of Δy and dy respectively are:

(A) 0.026 & 0.026005
(B) 0.026005 & 0.026
(C) 0.026005 & 0.26
(D) 0.0026 & 0.026

Answer: (B) 0.026005 & 0.026 · The council's preliminary key

Q298 AP EAPCET 2021 · 25 Aug · Shift 2 MCQ

If the function $f(x) = a\sin(x) + \frac{1}{3}\sin(3x)$ attains maximum value at $x = \frac{\pi}{3}$, then 'a' equals _____

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

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

Q299 AP EAPCET 2021 · 25 Aug · Shift 2 MCQ

The points on the curve $y = \frac{2}{3}x^3 + \frac{1}{2}x^2$, where the tangents make equal angles with coordinate axes are _____

(A) $\left(\frac{1}{2}, \frac{5}{24}\right)$ & $\left(-1, \frac{-1}{6}\right)$
(B) $\left(1, \frac{7}{6}\right)$ & $\left(-1, \frac{-1}{6}\right)$
(C) $\left(2, \frac{22}{3}\right)$ & $\left(\frac{1}{2}, \frac{5}{24}\right)$
(D) $\left(1, \frac{7}{6}\right)$ & $\left(2, \frac{22}{3}\right)$

Answer: (A) $\left(\frac{1}{2}, \frac{5}{24}\right)$ & $\left(-1, \frac{-1}{6}\right)$ · The council's preliminary key

Q300 AP EAPCET 2021 · 25 Aug · Shift 2 MCQ

Through the point $(4, 5)$, a straight line is drawn making positive intercepts on the coordinate axes. The area of the triangle thus formed is least, when the ratio of the intercepts on the x and y axes is _____

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

Answer: (C) $4 : 5$ · The council's preliminary key

Q301 AP EAPCET 2021 · 24 Aug · Shift 1 MCQ

If $f(x) = kx^3 - 9x^2 + 9x + 3$ $(k > 0)$ is increasing for all x, then _____

(A) $k \leq 3$
(B) $k \geq 3$
(C) $0 < k < 1$
(D) $1 < k < 3$

Answer: (B) $k \geq 3$ · The council's preliminary key

Q302 AP EAPCET 2021 · 24 Aug · Shift 1 MCQ

The maximum value of $y = x(\log x)^2$ is _____

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(A) e^{-2}
(B) $2e^{-2}$
(C) $3e^{-2}$
(D) $4e^{-2}$

Answer: (D) $4e^{-2}$ · The council's preliminary key

Q303 AP EAPCET 2021 · 24 Aug · Shift 1 MCQ

The point on the curve $y = x^3$, at which the tangent to the curve is parallel to the x-axis, is _____

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

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

Q304 AP EAPCET 2021 · 24 Aug · Shift 1 MCQ

Find the area of the triangle formed by the x-axis and the tangent and the normal to the curve $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ at the point $\left(\frac{a}{\sqrt{2}}, \frac{b}{\sqrt{2}}\right)$.

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

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

Q305 AP EAPCET 2021 · 24 Aug · Shift 2 MCQ

For the function $f(x) = x^3 - 6x^2 - 12x - 3$, $x = 2$ is a _____

(A) point of maxima
(B) point of minima
(C) point of inflection
(D) not a critical point

Answer: (C) point of inflection · The council's preliminary key

Q306 AP EAPCET 2021 · 24 Aug · Shift 2 MCQ

For the curve $y = 5x - 2x^3$, if 'x' increases at the rate of 2 units/sec, the rate of change in the slope of the curve at $x = 3$ is _____ /sec

(A) 72
(B) 27
(C) -72
(D) -27

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

Q307 AP EAPCET 2021 · 24 Aug · Shift 2 MCQ

If the relation p(subnormal length) $= q$(subtangent length)^2 holds true for the curve $by^2 = (x+a)^3$, then the value of $\frac{p}{q} =$

(A) $\frac{8}{27}$
(B) $\frac{8b}{27}$
(C) $\frac{8}{27b}$
(D) $\frac{27}{8b}$

Answer: (B) $\frac{8b}{27}$ · The council's preliminary key

Q308 AP EAPCET 2021 · 24 Aug · Shift 2 MCQ

The point on the curve $x^2 + y^2 = a^2,\ y \geq 0$, at which the tangent is parallel to the x-axis, is _____

(A) $(a, 0)$
(B) $(-a, 0)$
(C) $(0, a)$
(D) $(0, -a)$

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

Q309 AP EAPCET 2021 · 23 Aug · Shift 1 MCQ

The slope of the normal to the curve $y = \frac{x}{x^2+1}$ at $x = -4$ is

(A) $\frac{-289}{15}$
(B) $\frac{-15}{16}$
(C) $\frac{289}{15}$
(D) $\frac{15}{16}$

Answer: (C) $\frac{289}{15}$ · The council's preliminary key

Q310 AP EAPCET 2021 · 23 Aug · Shift 1 MCQ

The time period 'T' of a simple pendulum of length 'l' is given by $T = 2\pi\sqrt{\frac{l}{g}}$ where 'g' denotes the acceleration due to gravity. If the length of the pendulum is increased by 1 %, then the approximate

change in its time period is _____

(A) 0.5 %

(B) 2 %

(C) 1 %

(D) 4 %

Answer: (A) 0.5 % · The council's preliminary key

Q311 AP EAPCET 2021 · 23 Aug · Shift 1 MCQ

The absolute minimum value of $x^4 - x^2 - 2x + 5$ is _____

(A) $= 5$

(B) $= 3$

(C) $= 7$

(D) Does not exist

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

Q312 AP EAPCET 2021 · 23 Aug · Shift 1 MCQ

If the tangent to the curve $2y^3 = ax^2 + x^3$ at the point (a, a) cuts off intercepts α and β on the co-ordinate axes, where $\alpha^2 + \beta^2 = 61$, then the value of $|a|$ is _____

(A) 14

(B) 30

(C) 20

(D) 25

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

Q313 AP EAPCET 2021 · 23 Aug · Shift 1 MCQ

The sum of the lengths of the subtangent and the subnormal drawn at $\theta = \frac{\pi}{3}$ on the cycloid $x = a(\theta - \sin\theta)$; $y = a(1 - \cos\theta)$ is _____

(A) $2\sqrt{a}$

(B) $(2\sqrt{3})a$

(C) $\frac{2a}{\sqrt{3}}$

(D) $\frac{a}{\sqrt{3}}$

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

Q314 AP EAPCET 2021 · 23 Aug · Shift 2 MCQ

The volume of a spherical ball is increasing at a rate of $4\pi\ \text{cm}^3 \cdot \text{s}^{-1}$. The rate at which its radius increases, when its volume is $288\pi\ \text{cm}^3$, is _____ $\text{cm} \cdot \text{s}^{-1}$.

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(A) $\frac{1}{6}$
(B) $\frac{1}{36}$
(C) $\frac{1}{9}$
(D) $\frac{1}{24}$

Answer: (B) $\frac{1}{36}$ · The council's preliminary key

Q315 AP EAPCET 2021 · 23 Aug · Shift 2 MCQ

If $\mathrm{Sin}^{-1}(a)$ is the acute angle between the curves $x^2+y^2=4x$ and $x^2+y^2=8$ at the point $(2,2)$, then $a=$ _____

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

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

Q316 AP EAPCET 2021 · 23 Aug · Shift 2 MCQ

Find the coordinates of a point on the curve $y=x^2-3x+2$, at which the tangent drawn to this curve is perpendicular to the line $y=x$.

(A) $(0,2)$
(B) $(1,0)$
(C) $(-1,6)$
(D) $(2,-3)$

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

Q317 AP EAPCET 2021 · 23 Aug · Shift 2 MCQ

If the area of a circular sector of perimeter 60 m is to be maximized, then its radius must be _____ m

(A) 20
(B) 15
(C) 10
(D) 5

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

Q318 AP EAPCET 2021 · 20 Aug · Shift 1 MCQ

If $y=4x-6$ is a tangent to the curve $y^2=ax^4+b$ at $(3,6)$, then the values of a and b are _____

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(A) $a = \frac{4}{9}$ & $b = \frac{-4}{9}$

(B) $a = 0$ & $b = \frac{4}{9}$

(C) $a = \frac{-4}{9}$ & $b = \frac{-4}{9}$

(D) $a = \frac{4}{9}$ & $b = 0$

Answer: (D) $a = \frac{4}{9}$ & $b = 0$ · The council's preliminary key

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Q319 AP EAPCET 2021 · 20 Aug · Shift 1 MCQ

Find the positive value of 'a' for which the equality $2\alpha + \beta = 8$ holds, where 'α' and 'β' are the points of maximum and minimum, respectively, of the function $f(x) = 2x^3 - 9ax^2 + 12a^2x + 1$.

(A) 0

(B) 2

(C) 1

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

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

Q320 AP EAPCET 2021 · 20 Aug · Shift 1 MCQ

If the radius of a sphere is measured as 9 cm with an error of 0.03 cm, then find the approximate error in calculating its surface area.

(A) 2.16π cm^2

(B) 21.6π cm^2

(C) 216π cm^2

(D) 0.216π cm^2

Answer: (A) 2.16π cm^2 · The council's preliminary key

Q321 AP EAPCET 2021 · 20 Aug · Shift 1 MCQ

The diameter and altitude of a right circular cone, at a certain instant, were found to be 10 cm and 20 cm respectively. If its diameter is increasing at a rate of 2 cm/s, then at what rate must its altitude change, in order to keep its volume constant?

(A) 4 cm/s

(B) 6 cm/s

(C) -4 cm/s

(D) -8 cm/s

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

Q322 AP EAPCET 2021 · 20 Aug · Shift 2 MCQ

A spherical iron ball 10 cm in radius is coated with a layer of ice of uniform thickness, which melts at a rate of 50 cm^3/min. When the thickness of the ice is 5 cm, the rate at which the thickness of ice decreases is _____ cm/min

(A) $\frac{5}{6\pi}$
(B) $\frac{1}{54\pi}$
(C) $\frac{1}{18\pi}$
(D) $\frac{1}{36\pi}$

Answer: (C) $\frac{1}{18\pi}$ · The council's preliminary key

Q323 AP EAPCET 2021 · 20 Aug · Shift 2 MCQ

Find the minimum value of $2x + 3y$ when $xy = 6$.

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

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

Q324 AP EAPCET 2021 · 20 Aug · Shift 2 MCQ

The volume of a spherical balloon is increasing at the rate of 30 cc per minute. Find the rate of change of surface area of the balloon, when its radius is 6 cm.

(A) $5\ cm^2.min^{-1}$
(B) $30\ cm^2.min^{-1}$
(C) $10\ cm^2.min^{-1}$
(D) $20\ cm^2.min^{-1}$

Answer: (C) $10\ cm^2.min^{-1}$ · The council's preliminary key

Q325 AP EAPCET 2021 · 20 Aug · Shift 2 MCQ

If $g(x) = \frac{1}{6}f(3x^2 - 1) + \frac{1}{2}f(1 - x^2)$, $\forall x \in R$, where $f''(x) > 0$, $\forall x \in R$. Then $g(x)$ is increasing in the interval _____

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

Answer: (A) $\left(\frac{-1}{\sqrt{2}}, 0\right) \cup \left(\frac{1}{\sqrt{2}}, \infty\right)$ · The council's preliminary key

Q326 AP EAPCET 2021 · 20 Aug · Shift 2 MCQ

If the function $f(x) = 2x^3 - 9ax^2 + 12a^2x + 1$ attains its maximum and minimum at 'p' and 'q' respectively such that $p^2 = q$, then 'a' equals _____

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

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

Q327 AP EAPCET 2021 · 19 Aug · Shift 1 MCQ

The line which is parallel to x-axis and crosses the curve $y = \sqrt{x}$ at an angle of 45° is _____

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

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

Q328 AP EAPCET 2021 · 19 Aug · Shift 1 MCQ

If the error committed in measuring the radius of a circle is $0.05\,\%$, then the corresponding error in calculating its area would be _____

(A) $0.05\,\%$
(B) $0.0025\,\%$
(C) $0.25\,\%$
(D) $0.1\,\%$

Answer: (D) $0.1\,\%$ · The council's preliminary key

Q329 AP EAPCET 2021 · 19 Aug · Shift 1 MCQ

The stationary points of the curve $y = 8x^2 - x^4 - 4$ are _____

(A) $(0,-4),(2,12),(-2,12)$
(B) $(0,4),(-2,12),(1,2)$
(C) $(0,-4),(-1,2),(2,12)$
(D) $(0,4),(-1,2),(1,2)$

Answer: (A) $(0,-4),(2,12),(-2,12)$ · The council's preliminary key

Q330 AP EAPCET 2021 · 19 Aug · Shift 1 MCQ

Which statement among the following is true?

(i) The function $f(x)=x|x|$ is strictly increasing on $R-\{0\}$.
(ii) The function $f(x)=\log_{(1/4)} x$ is strictly increasing on $(0,\infty)$.
(iii) A one-one function is always an increasing function.
(iv) $f(x)=x^{1/3}$ is strictly decreasing on R

(A) (i)
(B) (ii)
(C) (iii)
(D) (iv)

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

Q331 AP EAPCET 2021 · 19 Aug · Shift 1 MCQ

For which value(s) of 'a', $f(x)=-x^3+4ax^2+2x-5$ is decreasing for every 'x'?

(A) $(1,2)$
(B) $(3,4)$
(C) R
(D) No value of 'a'

Answer: (D) No value of 'a' · The council's preliminary key

Q332 AP EAPCET 2021 · 19 Aug · Shift 1 MCQ

The distance between the origin and the normal to the curve $y=e^{2x}+x^2$ drawn at $x=0$ is _____ units

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

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

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Q333 AP EAPCET 2021 · 19 Aug · Shift 2 MCQ

Find the equation of a line passing through the point $(4, 3)$, which cuts a triangle of minimum area from the first quadrant.

(A) $3x + 4y = 24$
(B) $2x - y = 5$
(C) $2x + y = 8$
(D) $x - 2y = 5$

Answer: (A) $3x + 4y = 24$ · The council's preliminary key

Q334 AP EAPCET 2021 · 19 Aug · Shift 2 MCQ

The maximum value of $f(x) = \sin(x)$ in the interval $\left[\frac{-\pi}{2}, \frac{\pi}{2}\right]$ is _____

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

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

Q335 AP EAPCET 2021 · 19 Aug · Shift 2 MCQ

Given $f(x) = x^3 - 4x$, if 'x' changes from 2 to 1.99, then the approximate change in the value of $f(x)$ is _____

(A) 0.08
(B) -0.08
(C) 0.8
(D) -0.8

Answer: (B) -0.08 · The council's preliminary key

Q336 AP EAPCET 2021 · 19 Aug · Shift 2 MCQ

If the curves $\frac{x^2}{a^2} + \frac{y^2}{4} = 1$ and $y^3 = 16x$ intersect at right angles, then $a^2 =$ _____

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

Answer: (C) $\frac{4}{3}$ · The council's preliminary key

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Q337 AP EAPCET 2021 · 19 Aug · Shift 2 MCQ

Let 'x' and 'y' be the sides of two squares such that $y = x - x^2$. The rate of change of area of he second square with respect to area of the first square is _____

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

Answer: (A) $1 - 3x + 2x^2$ · The council's preliminary key

Q338 AP EAPCET 2021 · 19 Aug · Shift 2 MCQ

If $f''(x)$ is a positive function for all $x \in R$, $f'(3) = 0$ and $g(x) = f(\tan^2(x) - 2\tan(x) + 4)$ for $0 < x < \frac{\pi}{2}$, then the interval in which $g(x)$ is increasing is _____

(A) $\left(\frac{\pi}{6}, \frac{\pi}{3}\right)$
(B) $\left(0, \frac{\pi}{4}\right)$
(C) $\left(0, \frac{\pi}{3}\right)$
(D) $\left(\frac{\pi}{4}, \frac{\pi}{2}\right)$

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

Q339 TS EAMCET 2021 · 6 Aug · Shift 1 MCQ

The semi vertical angle of a right circular cone is 30°. If the height of the cone is 6.125 cm, then the approximate value of the volume of the cone (in cubic cm) is

(A) $(23.5)\pi$
(B) $(76.5)\pi$
(C) 48π
(D) $(25.5)\pi$

Answer: (D) $(25.5)\pi$ · The council's preliminary key

Q340 TS EAMCET 2021 · 6 Aug · Shift 1 MCQ

The equation of the normal drawn to the curve $y = \sin 3x$ at $x = \frac{\pi}{4}$ is

(A) $y = \frac{\sqrt{3}}{2}\left(x + \frac{6-\pi}{4}\right)$

(B) $y = \frac{\sqrt{2}}{3}\left(x + \frac{6-\pi}{4}\right)$

(C) $y = \frac{\sqrt{3}}{2}\left(x - \frac{6-\pi}{4}\right)$

(D) $y = \frac{\sqrt{2}}{3}\left(x - \frac{6-\pi}{4}\right)$

Answer: (B) $y = \frac{\sqrt{2}}{3}\left(x + \frac{6-\pi}{4}\right)$ · The council's preliminary key

Q341 TS EAMCET 2021 · 6 Aug · Shift 1 MCQ

Suppose A, B, C and D are the 4 intersection points of the curves $\frac{x^2}{18} + \frac{y^2}{8} = 1$ and $x^2 - y^2 = 5$ in 1st, 2nd, 3rd and 4th quadrants respectively. If $\theta_1, \theta_2, \theta_3$ and θ_4 respectively are the angles between the curves at A, B, C and D, then

(A) $\theta_1 \neq \theta_2 \neq \theta_3 \neq \theta_4$

(B) $\theta_1 = \theta_2;\ \theta_3 = \theta_4;\ \theta_2 \neq \theta_3$

(C) $\theta_1 = \theta_3;\ \theta_2 = \theta_4;\ \theta_3 \neq \theta_2$

(D) $\theta_1 = \theta_2 = \theta_3 = \theta_4$

Answer: (D) $\theta_1 = \theta_2 = \theta_3 = \theta_4$ · The council's preliminary key

Q342 TS EAMCET 2021 · 6 Aug · Shift 2 MCQ

The side of an equilateral triangle is 5 units. In measuring the side, an error of 0.05 units is made. Then the percentage error in measuring the area of the triangle is

(A) 2

(B) 3

(C) 4

(D) 5

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

Q343 TS EAMCET 2021 · 6 Aug · Shift 2 MCQ

The ratio of the length of the subnormal to the square of the length of the subtangent at any point P on the curve $y^2 = (2x+1)^3$ is

(A) 27
(B) $\frac{1}{9}$
(C) 9
(D) $\frac{8}{27}$

Answer: (A) 27 · The council's preliminary key

Q344 TS EAMCET 2021 · 6 Aug · Shift 2 MCQ

If θ is the acute angle between the curves $x^2+y^2=2020\sqrt{2}$ and $x^2-y^2=2020$, then $\frac{\sin\theta+\cos\theta}{\tan\theta}=$

(A) $\sqrt{2}$
(B) $\frac{3+\sqrt{3}}{2}$
(C) $\frac{3+\sqrt{3}}{4}$
(D) $\frac{3+\sqrt{3}}{6}$

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

Q345 TS EAMCET 2021 · 5 Aug · Shift 1 MCQ

The equation of the tangent to the curve $xy^5+2x^2y-x^3+y+1=0$ at $x=0$ is

(A) $3x+4y+4=0$
(B) $y=x-1$
(C) $5x+7y+7=0$
(D) $x+y+1=0$

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

Q346 TS EAMCET 2021 · 5 Aug · Shift 1 MCQ

A particle moves in a straight line such that its displacement S (in mts) at a time t (in sec) is given by $S(t)=t^3-4t^2+7t$. The instantaneous velocity v at $t=4$ is

(A) $21\ \mathrm{m/sec}$
(B) $23\ \mathrm{m/sec}$
(C) $20\ \mathrm{m/sec}$
(D) $19\ \mathrm{m/sec}$

Answer: (B) $23\ \mathrm{m/sec}$ · The council's preliminary key

Q347 TS EAMCET 2021 · 5 Aug · Shift 1 MCQ

If the two curves $x=y^2$ and $xy=K$ cut each other at right angles, then a possible value of K is

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

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

Q348 TS EAMCET 2021 · 5 Aug · Shift 2 MCQ

Let $\mathbb{R}^* = \mathbb{R} - \left\{(2k-1)\frac{\pi}{2} / k \in I\right\}$. The function $f : \mathbb{R}^* \to \mathbb{R}$ is defined as $f(x) = \tan x - x$, then $f(x)$ is

(A) an increasing function
(B) a decreasing function
(C) minimum at $x = 0$
(D) periodic function

Answer: (A) an increasing function · The council's preliminary key

Q349 TS EAMCET 2021 · 5 Aug · Shift 2 MCQ

If the tangent to the curve $xy + ax + by = 0$ at $(1, 1)$ makes an angle $\mathrm{Tan}^{-1}2$ with X-axis, then $\frac{a+b}{ab} =$

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

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

Q350 TS EAMCET 2021 · 5 Aug · Shift 2 MCQ

The volume of a spherical balloon is increasing at the rate of $2\ \mathrm{cm}^3/\mathrm{sec}$. When its radius is 4 cm, the rate of change of its surface area (in $\mathrm{cm}^2/\mathrm{sec}$) is

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

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

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Q351 TS EAMCET 2021 · 5 Aug · Shift 2 MCQ

If a cubic function $f(x) = ax^3 + bx^2 - \frac{18}{5}x + \frac{19}{10}$ has maximum value 10 at $x = -3$ and has minimum value $\frac{-5}{2}$ at $x = 2$, then $f(1) =$

(A) -10
(B) $\frac{-6}{5}$
(C) 6
(D) $\frac{28}{5}$

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

Q352 TS EAMCET 2021 · 4 Aug · Shift 1 MCQ

The approximate value of $(8.01)^{4/3} + (8.01)^2$ upto 3 decimal places is

(A) 80.116
(B) 80.216
(C) 80
(D) 80.186

Answer: (D) 80.186 · The council's preliminary key

Q353 TS EAMCET 2021 · 4 Aug · Shift 1 MCQ

If the tangent at a point P on the curve $y = 4x^4 + x$ is perpendicular to the tangent to the same curve at $(0, 0)$, then the point P is

(A) $\left(\frac{-1}{2}, \frac{-1}{4}\right)$
(B) $\left(\frac{1}{2}, \frac{3}{4}\right)$
(C) $(1,\ 5)$
(D) $(-1,\ 3)$

Answer: (A) $\left(\frac{-1}{2}, \frac{-1}{4}\right)$ · The council's preliminary key

Q354 TS EAMCET 2021 · 4 Aug · Shift 1 MCQ

The angle between the curves $2x^2 + y^2 = 20$ and $4y^2 - x^2 = 8$ at a point where they intersect in the 4th quadrant is

(A) 0
(B) $\frac{\pi}{2}$
(C) $\frac{\pi}{4}$
(D) $\frac{\pi}{6}$

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

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Q355 TS EAMCET 2021 · 4 Aug · Shift 2 MCQ

The point at which the tangent line to the curve of $y = \frac{16}{x} - x^2$ is horizontal, is

(A) $(2, 4)$
(B) $(-2, -12)$
(C) $(1, 15)$
(D) $(-1, -17)$

Answer: (B) $(-2, -12)$ · The council's preliminary key

Q356 TS EAMCET 2021 · 4 Aug · Shift 2 MCQ

The equation of the tangent to the curve $y = \pi e^{\frac{-x}{\pi}}$ at the point where it crosses Y-axis is

(A) $\pi x + 2y = 2\pi$
(B) $2x + \pi y = \pi^2$
(C) $x - y + \pi = 0$
(D) $x + y = \pi$

Answer: (D) $x + y = \pi$ · The council's preliminary key

Q357 TS EAMCET 2021 · 4 Aug · Shift 2 MCQ

If the radius of a spherical balloon is increasing at the rate of 5 inch per minute, then the rate at which the volume increases (in cube inches per minute) when the radius is 10 inches is

(A) $100\,\pi$
(B) $1000\,\pi$
(C) $2000\,\pi$
(D) $25000\,\pi$

Answer: (C) $2000\,\pi$ · The council's preliminary key

Q358 TS EAMCET 2021 · 4 Aug · Shift 2 MCQ

The absolute maximum value of the function $f(x) = 2x^3 - 9x^2 + 12x + 1$ on $[0, 2]$ is

(A) 8
(B) 1
(C) 6
(D) 5

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

Q359 AP EAMCET 2020 · 7 Oct · Shift 1 MCQ

The two positive numbers with sum 't', and the sum of their squares is minimum are

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

Answer: (C) $\frac{t}{2}, \frac{t}{2}$ · The council's preliminary key

Q360 AP EAMCET 2020 · 7 Oct · Shift 1 MCQ

The side of an equilateral triangle is increasing at the rate of $2\ cm/s$, then the rate at which the area is increasing when the side of the triangle is $20\ cm$ is

(A) $5\sqrt{3}\ cm^2/s$
(B) $10\sqrt{3}\ cm^2/s$
(C) $25\sqrt{3}\ cm^2/s$
(D) $20\sqrt{3}\ cm^2/s$

Answer: (D) $20\sqrt{3}\ cm^2/s$ · The council's preliminary key

Q361 AP EAMCET 2020 · 7 Oct · Shift 1 MCQ

If the normal to the curve $y = x + \frac{2}{x}$ at the point where abscissa is 2, meets the coordinate axes in points A & B, find the length of AB.

(A) $\frac{2}{\sqrt{5}}$
(B) $\frac{7}{2}$
(C) $\frac{7\sqrt{5}}{2}$
(D) $\frac{3\sqrt{5}}{2}$

Answer: (C) $\frac{7\sqrt{5}}{2}$ · The council's preliminary key

Q362 AP EAMCET 2020 · 7 Oct · Shift 1 MCQ

For the function $f(x) = x^{40} - x^{20}$ find the absolute minimum value in the interval $[0, 1]$

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(A) $\frac{1}{2}$
(B) $\frac{-1}{4}$
(C) 0
(D) 1

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

Q363 AP EAMCET 2020 · 23 Sep · Shift 1 MCQ

The tangent to the curve $y = e^{2x}$ at the point $(0, 1)$ meets the x-axis at _____

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

Answer: (C) $\left(\frac{-1}{2}, 0\right)$ · The council's preliminary key

Q364 AP EAMCET 2020 · 23 Sep · Shift 1 MCQ

If $y = \frac{(ax - b)}{(x - 1)(x - 4)}$ has a turning point $P(2, -1)$, then the values of a and b are

(A) $a = 0,\ b = 1$
(B) $a = 1,\ b = 0$
(C) $a = -1,\ b = 0$
(D) $a = 0,\ b = -1$

Answer: (B) $a = 1,\ b = 0$ · The council's preliminary key

Q365 AP EAMCET 2020 · 23 Sep · Shift 1 MCQ

If the curved surface area of right circular cylinder inscribed in a sphere of radius 22 cm is maximum then height of the cylinder will be

(A) $\frac{11}{\sqrt{2}}$ cm
(B) $11\sqrt{2}$ cm
(C) $(0.22)\sqrt{2}$ m
(D) $(0.11)\sqrt{2}$ m

Answer: (C) $(0.22)\sqrt{2}$ m · The council's preliminary key

Q366 AP EAMCET 2020 · 23 Sep · Shift 1 MCQ

The difference between the greatest and least values of the function $f(x) = -x + \sin 2x$ on $\left[-\frac{\pi}{2}, \frac{\pi}{2}\right]$ is

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

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

Q367 AP EAMCET 2020 · 22 Sep · Shift 1 MCQ

Which of the following is true about $f(x)=3\sinh(x)-2\cosh(x), \forall x \in R$

(A) f is an odd function
(B) f is a periodic function
(C) f is a strictly increasing function on R
(D) f is a strictly decreasing function on R

Answer: (C) f is a strictly increasing function on R · The council's preliminary key

Q368 AP EAMCET 2020 · 22 Sep · Shift 1 MCQ

The equation of the normal to the curve $y=\sin x$ at the point $(0,0)$ is _____

(A) $x=0$
(B) $y=0$
(C) $x+y=0$
(D) $x-y=0$

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

Q369 AP EAMCET 2020 · 22 Sep · Shift 1 MCQ

Displacement 's' of a particle, in meters, at any time 't' seconds is expressed as $s=\frac{t^3}{3}-6t$. Find the acceleration at a time when the velocity vanishes.

(A) $6\ \mathrm{m.s^{-2}}$
(B) $2\sqrt{6}\ \mathrm{m.s^{-2}}$
(C) $12\ \mathrm{m.s^{-2}}$
(D) $6\sqrt{6}\ \mathrm{m.s^{-2}}$

Answer: (B) $2\sqrt{6}\ \mathrm{m.s^{-2}}$ · The council's preliminary key

Q370 AP EAMCET 2020 · 22 Sep · Shift 1 MCQ

The radius of a circle is increasing at a rate of $0.1\ \mathrm{cm.s^{-1}}$. Then the rate of change of area, when its radius is $5\ \mathrm{cm}$, is _____

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(A) $\pi^2\ \mathrm{cm}^2.\mathrm{s}^{-1}$
(B) $\pi\ \mathrm{cm}^2.\mathrm{s}^{-1}$
(C) $2\pi\ \mathrm{cm}^2.\mathrm{s}^{-1}$
(D) $\frac{\pi}{2}\ \mathrm{cm}^2.\mathrm{s}^{-1}$

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

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Q371 AP EAMCET 2020 · 22 Sep · Shift 1 MCQ

What is an approximate value of $\sqrt{199}$ corrected to 4 decimal places?

(A) 14.1608
(B) 14.0168
(C) 14.1086
(D) 14.1068

Answer: (D) 14.1068 · The council's preliminary key

Q372 AP EAMCET 2020 · 22 Sep · Shift 2 MCQ

If displacement $s = 5\sin(2t)$, then the velocity at the end of $\frac{\pi}{3}$ seconds is

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

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

Q373 AP EAMCET 2020 · 22 Sep · Shift 2 MCQ

If M is a point on the line $y = x$ and points $P(0,1)$, $Q(2,0)$ are such that $PM + QM$ is minimum, the coordinates of M are

(A) $(0,0)$
(B) $\left(\frac{13}{17}, \frac{13}{17}\right)$
(C) $\left(\frac{1}{7}, \frac{1}{7}\right)$
(D) $\left(\frac{31}{7}, \frac{31}{7}\right)$

Answer: (D) $\left(\frac{31}{7}, \frac{31}{7}\right)$ · The council's preliminary key

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Q374 AP EAMCET 2020 · 22 Sep · Shift 2 MCQ

What is the value of $\sqrt[3]{26}$ corrected up to three decimal places?

(A) 2.998
(B) 2.844
(C) 2.962
(D) 2.823

Answer: (C) 2.962 · The council's preliminary key

Q375 AP EAMCET 2020 · 22 Sep · Shift 2 MCQ

Find the equation of normal to the curve $y = x^3 - 3x$, which is parallel to the line $2x + 18y = 9$?

(A) $x + 9y = 20$ only
(B) $x + 9y = 40$ only
(C) $x + 9y = \pm 20$
(D) $x + 9y = \pm 40$

Answer: (C) $x + 9y = \pm 20$ · The council's preliminary key

Q376 AP EAMCET 2020 · 22 Sep · Shift 2 MCQ

If the increase in the side of square is 6 %, then the approximate percentage increase in its area _____

(A) $36\ \%$
(B) $12\ \%$
(C) $3\ \%$
(D) $4\ \%$

Answer: (B) $12\ \%$ · The council's preliminary key

Q377 AP EAMCET 2020 · 21 Sep · Shift 1 MCQ

The interval in which $y = \ln(\ln(x)),\ x > 1$ is decreasing is

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

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

Q378 AP EAMCET 2020 · 21 Sep · Shift 1 MCQ

Maximum area of the rectangle that can be formed with the fixed perimeter 'p' cm _____

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(A) $\frac{p^2}{8}\ \text{cm}^2$
(B) $\frac{p^2}{16}\ \text{cm}^2$
(C) $\frac{p^2}{64}\ \text{cm}^2$
(D) $\frac{p^2}{32}\ \text{cm}^2$

Answer: (B) $\frac{p^2}{16}\ \text{cm}^2$ · The council's preliminary key

Q379 AP EAMCET 2020 · 21 Sep · Shift 2 MCQ

If the tangent to the curve $x^{2/3}+y^{2/3}=a^{2/3}$ meets the x-axis at A and y-axis at B, then $AB=$

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

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

Q380 AP EAMCET 2020 · 21 Sep · Shift 2 MCQ

The curve $y=ax^3+bx^2+cx+5$ touches the x-axis at $P(-2,0)$ and cuts y-axis at a point Q where gradient is 3. Then the values of a,b,c are

(A) $a=\frac{-1}{2},\ b=\frac{-3}{4},\ c=3$
(B) $a=\frac{1}{2},\ b=\frac{3}{4},\ c=3$
(C) $a=1,\ b=2,\ c=3$
(D) $a=-1,\ b=-2,\ c=3$

Answer: (A) $a=\frac{-1}{2},\ b=\frac{-3}{4},\ c=3$ · The council's preliminary key

Q381 AP EAMCET 2020 · 18 Sep · Shift 1 MCQ

The curve $3y^2=2ax^2+6b$ passes through the point $P(3,-1)$ and the gradient of the curve at P is "-1", then the values of a and b are

(A) $a=\frac{1}{2},\ b=-1$
(B) $a=\frac{-1}{2},\ b=1$
(C) $a=\frac{1}{2},\ b=1$
(D) $a=\frac{-1}{2},\ b=-1$

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

Q382 AP EAMCET 2020 · 18 Sep · Shift 1 MCQ

The value of 'k' for which the function $f(x)=k(x+\sin x)+k$ is increasing, is equal to

(A) $k < 0$
(B) $k > 0$
(C) $k = 0$
(D) Data Insufficient

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

Q383 AP EAMCET 2020 · 18 Sep · Shift 1 MCQ

The lengths of the sides of the rectangle of greatest area that can be inscribed in the ellipse $x^2 + 4y^2 = 64$ are

(A) $6\sqrt{2},\ 4\sqrt{2}$
(B) $8\sqrt{2},\ 4\sqrt{2}$
(C) $8\sqrt{2},\ 8\sqrt{2}$
(D) $16\sqrt{2},\ 4\sqrt{2}$

Answer: (B) $8\sqrt{2},\ 4\sqrt{2}$ · The council's preliminary key

Q384 AP EAMCET 2020 · 18 Sep · Shift 1 MCQ

The equation of the normal to the curve $x = a\cosh(t)$, $y = b\sinh(t)$ at any point t is

(A) $ax + by = a^2 + b^2$
(B) $ax\,\mathrm{sech}(t) + by\,\mathrm{cosech}(t) = a^2 + b^2$
(C) $ax\,\mathrm{sech}(t) - by\,\mathrm{cosech}(t) = a^2 - b^2$
(D) $\dfrac{ax}{\sinh(t)} + \dfrac{by}{\cosh(t)} = a^2 + b^2$

Answer: (B) $ax\,\mathrm{sech}(t) + by\,\mathrm{cosech}(t) = a^2 + b^2$ · The council's preliminary key

Q385 AP EAMCET 2020 · 18 Sep · Shift 1 MCQ

Find the equation of the normal to the curve $y = \dfrac{(x-7)}{(x-2)(x-3)}$ at the point where it cuts the x-axis.

(A) $20x + y + 140 = 0$
(B) $x - 20y - 140 = 0$
(C) $x + 20y + 140 = 0$
(D) $20x + y - 140 = 0$

Answer: (D) $20x + y - 140 = 0$ · The council's preliminary key

Q386 AP EAMCET 2020 · 18 Sep · Shift 2 MCQ

The curves $y = 4x^2 + 2x - 8$ and $y = x^3 - x + 13$ touch each other at the point

(A) $(34, 3)$
(B) $(3, 34)$
(C) $(-3, 34)$
(D) $(-34, 3)$

Answer: (B) $(3, 34)$ · The council's preliminary key

Q387 AP EAMCET 2020 · 18 Sep · Shift 2 MCQ

If the subnormal at any point on the curve $y^n = ax$ is constant then the value of n is

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

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

Q388 AP EAMCET 2020 · 18 Sep · Shift 2 MCQ

If the radius of a sphere is mentioned as $7\ m$ with an error of $0.02\ m$ then the approximate error in calculating its volume is

(A) $1.83\pi\ m^3$
(B) $2.25\pi\ m^3$
(C) $4.39\pi\ m^3$
(D) $3.92\pi\ m^3$

Answer: (D) $3.92\pi\ m^3$ · The council's preliminary key

Q389 AP EAMCET 2020 · 18 Sep · Shift 2 MCQ

The tangent at the point $(1, 2)$ to the curve $y^2 = 4x$ makes an angle θ with the positive direction of x-axis. Then $\theta =$

(A) 60°
(B) 30°
(C) 90°
(D) 45°

Answer: (D) 45° · The council's preliminary key

Q390 AP EAMCET 2020 · 17 Sep · Shift 1 MCQ

The values of x at the stationary points of $f(x) = x^3 + 3x^2 - 2$ are

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

Answer: (C) $0, -2$ · The council's preliminary key

Q391 AP EAMCET 2020 · 17 Sep · Shift 1 MCQ

The function $f(x) = (1/2)^x$ on R is

(A) Strictly decreasing
(B) Strictly increasing
(C) Decreasing
(D) Neither increasing nor decreasing

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

Q392 AP EAMCET 2020 · 17 Sep · Shift 1 MCQ

The slope of the tangent of the curve $\left(\frac{x}{31}\right)^n + \left(\frac{y}{1209}\right)^n = 2$ at $(31, 1209)$ _____

(A) -39
(B) 39
(C) $\frac{1}{39}$
(D) $\frac{-1}{39}$

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

Q393 AP EAMCET 2020 · 17 Sep · Shift 1 MCQ

If $y = 5x^2 + 6x + 6,\ x = 2,\ \Delta x = 0.001$ then value of dy is

(A) 0.026
(B) 0.0026
(C) 0.062
(D) 0.0062

Answer: (A) 0.026 · The council's preliminary key

Q394 AP EAMCET 2020 · 17 Sep · Shift 2 MCQ

A man, $2\,m$ tall, walks at the rate of $1\frac{2}{3}\ m/s$ towards a street light which is $5\frac{1}{3}\ m$ above the ground. The rate at which the length of his shadow is changing when he is $3\frac{1}{3}\ m$ away from the base of the light is _____

(A) $-1\ m/s$
(B) $2\ m/s$
(C) $-2\ m/s$
(D) $1\ m/s$

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

Q395 AP EAMCET 2020 · 17 Sep · Shift 2 MCQ

The equation of tangent to the curve $y = 5x^2 - 3x + 7$ at the point $(-1, 4)$ is _____

(A) $13x - y - 9 = 0$
(B) $13x + y - 9 = 0$
(C) $13x + y + 9 = 0$
(D) $13x + 2y + 5 = 0$

Answer: (C) $13x + y + 9 = 0$ · The council's preliminary key

Q396 AP EAMCET 2020 · 17 Sep · Shift 2 MCQ

A kind of bacteria grows by t^3 in t seconds. Time taken for the rate of growth of the bacteria to become 1200 per second is _____

(A) 10 seconds
(B) 20 seconds
(C) 40 seconds
(D) 400 seconds

Answer: (B) 20 seconds · The council's preliminary key

Q397 AP EAMCET 2020 · 17 Sep · Shift 2 MCQ

The sides of an equilateral triangle are increasing at the rate of $2\ cm.s^{-1}$. How fast does its area increase when its side is $10\ cm$?

(A) $10\sqrt{3}\ cm^2.s^{-1}$
(B) $5\sqrt{3}\ cm^2.s^{-1}$
(C) $\sqrt{3}\ cm^2.s^{-1}$
(D) $2\sqrt{3}\ cm^2.s^{-1}$

Answer: (A) $10\sqrt{3}\ cm^2.s^{-1}$ · The council's preliminary key

Q398 TS EAMCET 2020 · 14 Sep · Shift 1 MCQ

A vessel in the shape of an inverted cone of height $10\,\text{ft}$ and semi vertical angle 30^0 is full of water. Due to a hole at the vertex, the slant height of the water in the vessel is decreasing at a constant rate

of $\frac{1}{\sqrt{3}}$ feet per minute. The rate (in cu. feet/min) at which the volume of water in the vessel is decreasing, when the volume of water is $\frac{8\pi}{\sqrt{3}}$ cubic feet, is

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

Answer: (B) 2π · Official TGCHE final key

Q399 TS EAMCET 2020 · 14 Sep · Shift 1 MCQ

The area (in sq. units) of the triangle formed by the tangent and normal drawn to the curve $\left(\frac{x}{3}\right)^n + \left(\frac{y}{4}\right)^n = 2$ at $(3, 4)$ and X-axis is

(A) $\frac{100}{3}$
(B) 48
(C) $\frac{50}{3}$
(D) 144

Answer: (C) $\frac{50}{3}$ · Official TGCHE final key

Q400 TS EAMCET 2020 · 14 Sep · Shift 1 MCQ

If the curves $ax^2 + by^2 = 1$ and $cx^2 + dy^2 = 1$ intersect orthogonally, then $\frac{b-a}{d-c} =$

(A) $\frac{a}{c} \cdot \frac{b}{d}$
(B) $\frac{a+b}{c+d}$
(C) 1
(D) 0

Answer: (A) $\frac{a}{c} \cdot \frac{b}{d}$ · Official TGCHE final key

Q401 TS EAMCET 2020 · 14 Sep · Shift 1 MCQ

The ratio of the maximum and minimum values attained by the function $f(x) = 1 + 2\sin x + 3\cos^2 x,\ 0 \le x \le \frac{2\pi}{3}$ is

(A) $3 : 1$
(B) $13 : 9$
(C) $9 : 4$
(D) $8 : 13$

Answer: (B) $13 : 9$ · Official TGCHE final key

Q402 TS EAMCET 2020 · 14 Sep · Shift 2 MCQ

The angle A of ΔABC is found by measurement to be $67\frac{1}{2}^{\circ}$ and the area of ΔABC is calculated from the measurements of b, c, A. In measuring A, an error of 9 minutes is made then the percentage error in the area of the triangle is

(A) $\frac{\pi}{6}(2-\sqrt{3})$
(B) $\frac{\pi}{6}(2+\sqrt{3})$
(C) $\frac{\pi}{12}(\sqrt{2}+1)$
(D) $\frac{\pi}{12}(\sqrt{2}-1)$

Answer: (D) $\frac{\pi}{12}(\sqrt{2}-1)$ · Official TGCHE final key

Q403 TS EAMCET 2020 · 14 Sep · Shift 2 MCQ

Let $f:\mathbb{R}\to\mathbb{R}$ be a bijection. A curve represented by $y=f(x)$ is such that $f'(x)>0\,\forall x\in\mathbb{R}$. The tangent and normal drawn at $P(\alpha,1)$ on the curve cuts the X-axis at A, B respectively and C is the foot of the perpendicular from P onto the X-axis. If $P(\alpha,1)$ is such a point that $AC+CB$ is minimum, then the tangent at P is parallel to the line

(A) $x-y=0$
(B) $\alpha x+y-1=0$
(C) $\bar{j}$
(D) $\frac{2x}{\alpha}-y=\alpha^2$

Answer: (A) $x-y=0$ · Official TGCHE final key

Q404 TS EAMCET 2020 · 14 Sep · Shift 2 MCQ

The x-coordinate changes on the curve $y=3x^5+15x-8$ at the rate of $\frac{1}{5}$ units / sec. $A(x_1,y_1)$, $B(x_2,y_2)$ are the points on the curve at which the y-coordinate changes at the rate of 6 units / sec, then the slope of $AB=$

(A) 10
(B) $\mathrm{Tan}^{-1}\left(\frac{1}{2}\right)$
(C) 18
(D) $\mathrm{Tan}^{-1}2$

Answer: (C) 18 · Official TGCHE final key

Q405 TS EAMCET 2020 · 14 Sep · Shift 2 MCQ

In ΔABC, $\angle B=90^{\circ}$ and $(b+a)$ is always a constant. In order that ΔABC encloses the maximum area, $\angle C=$

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

Answer: (C) $\frac{\pi}{3}$ · Official TGCHE final key

Q406 TS EAMCET 2020 · 11 Sep · Shift 1 MCQ

If the tangent and normal drawn to the curve $x = a(\theta + \sin\theta)$, $y = a(1 - \cos\theta)$ at $P\left(\theta = \frac{\pi}{2}\right)$ cuts the X-axis at A and B respectively, then the area (in sq. units) of Δ PAB is

(A) $\frac{a^2}{\sqrt{2}}$
(B) $\frac{\sqrt{2}}{a^2}$
(C) a^2
(D) $2a^2$

Answer: (C) a^2 · Official TGCHE final key

Q407 TS EAMCET 2020 · 11 Sep · Shift 1 MCQ

$x_1, x_2 \in N$. If a line having slope 2 is a tangent to the curve $y = x^4 - 6x^3 + 13x^2 - 10x + 5$ at points $P(x_1, y_1)$ and $Q(x_2, y_2)$, then $x_1x_2 + y_1y_2 =$

(A) 17
(B) -5
(C) 13
(D) -10

Answer: (A) 17 · Official TGCHE final key

Q408 TS EAMCET 2020 · 11 Sep · Shift 1 MCQ

A function $y = f(x)$ with $f(-1) = -249$ has no maximum and has only one minimum at $x = 5$ with $f(5) = 75$. Which one of the following is true?

(A) At some point in $(-1, 5)$, $f(x)$ is discontinuous
(B) The minimum value cannot be 75 since $f(-1) < f(5) = 75$
(C) $f(x)$ is discontinuous at every point of $\mathbb{R}$
(D) $f(x)$ is continuous on $\mathbb{R}$

Answer: (A) At some point in $(-1, 5)$, $f(x)$ is discontinuous · Official TGCHE final key

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Q409 TS EAMCET 2020 · 11 Sep · Shift 2 MCQ

The approximate value of $\left(\sqrt[3]{126}+\sin 61^{\circ}\right)$ correct to three decimal places, obtained by taking $1^{\circ}=0.0174$ radians, is

(A) 5.772
(B) 5.765
(C) 5.806
(D) 5.888

Answer: (D) 5.888 · Official TGCHE final key

Q410 TS EAMCET 2020 · 11 Sep · Shift 2 MCQ

The radius of a sphere is changing. At an instant of time the rate of change in its volume and its surface area are equal. Then the value of radius at that instant is?

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

Answer: (B) 2 · Official TGCHE final key

Q411 TS EAMCET 2020 · 11 Sep · Shift 2 MCQ

The volume of a sphere is increasing at the rate of 4π c.c /sec. When its volume is 288π c.c, the rate of increase (in cm/sec) in its radius is

(A) $\frac{1}{36}$
(B) $\frac{1}{6}$
(C) $\frac{1}{7}$
(D) $\frac{1}{49}$

Answer: (A) $\frac{1}{36}$ · Official TGCHE final key

Q412 TS EAMCET 2020 · 11 Sep · Shift 2 MCQ

Assertion (A) : The function $f(x)=x-\log\left(\frac{1+x}{x}\right)$, $x>0$ has no maximum.

Reason (R) : If a function $f(x)$ is strictly increasing in an interval (a, b), then at any point in (a, b) $f'(x)\neq 0$

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 the not (sic) the correct explanation for A
(C) (A) is true but (R) is false
(D) (A) is false but (R) is true

Answer: (C) (A) is true but (R) is false · Checked by our team

Q413 TS EAMCET 2020 · 10 Sep · Shift 1 MCQ

If the area of a circle increases at the rate of $\frac{1}{\sqrt{\pi}}$ sq. units /sec, then the rate (in units/sec) at which the perimeter of the circle changes, when perimeter is $\sqrt{\pi}$ units, is

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

Answer: (A) 2 · Official TGCHE final key

Q414 TS EAMCET 2020 · 10 Sep · Shift 1 MCQ

Let a be a fixed positive real number and n be an arbitrary constant. For the curve $y = \frac{x^n}{a^{n-1}}$, if the length of the subnormal at any point (α, β) is proportional to α^2, then $n =$

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

Answer: (D) $\frac{3}{2}$ · Official TGCHE final key

Q415 TS EAMCET 2020 · 10 Sep · Shift 1 MCQ

Let $p(x)$ be a polynomial of degree 3 having extreme value at $x = 1$. If $\lim_{x \to 0} \left(\frac{p(x) + 4}{x^2} + 2 \right) = 6$, then $\left(\frac{dp}{dx} \right)_{x = \frac{1}{2}} =$

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

Answer: (A) 2 · Official TGCHE final key

Q416 TS EAMCET 2020 · 10 Sep · Shift 2 MCQ

If $\frac{k}{\alpha^3}$ is the length of the sub normal at any point $P(\alpha, y)$ on the curve $x^2 - a^2 = \frac{x^2y^2}{a^2}$, then $k =$

(A) a

(B) a^2

(C) $\frac{3a}{2}$

(D) a^4

Answer: (D) a^4 · Official TGCHE final key

Q417 TS EAMCET 2020 · 10 Sep · Shift 2 MCQ

A tank in the shape of a rectangular parallelopiped has volume 27 cubic meters. This tank is filled with water such that the rate of change of level of the water is thrice the rate of change water quantity falling in the tank, then the height of the tank (in meters) is

(A) 9

(B) 18

(C) 81

(D) 243

Answer: (C) 81 · Official TGCHE final key

Q418 TS EAMCET 2020 · 10 Sep · Shift 2 MCQ

Match the functions of List I with the items of List II.

List I

A) $3x^4 - 2x^3 - 6x^2 + 6x + 1$

B) $x + \frac{1}{x}$, $\forall x < 0$

C) $x^4(7 - x)^3$

D) $x^4 + (8 - x)^4$

List II

I) has minimum value at $x = 4$

II) has maximum value at $x = -1$

III) has maximum value at $x = 4$

IV) is decreasing in $[2, \infty)$

V) is increasing in $[2, \infty)$

The correct match is

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

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

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

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

Answer: (C) A-V, B-II, C-III, D-I · Official TGCHE final key

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Q419 TS EAMCET 2020 · 9 Sep · Shift 1 MCQ

The number of points on the parabola $y^2 = x$ at which the slope of the normal drawn at the point is equal to the x - coordinate of that point is

(A) ∞
(B) 1
(C) 2
(D) 0

Answer: (C) 2 · Official TGCHE final key

Q420 TS EAMCET 2020 · 9 Sep · Shift 1 MCQ

Let α, β be two roots of the quadratic equation $x^2 + ax - b = 0$, $b \neq 0$. If the straight line $x\cos\theta + y\sin\theta = C$ touches the curve $\left(\frac{x}{\alpha}\right)^n + \left(\frac{y}{\beta}\right)^n = 2$ at the point (α, β), then $\left(\frac{a}{b}\right)^2 + \frac{2}{b} =$

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

Answer: (B) $\frac{4}{C^2}$ · Official TGCHE final key

Q421 TS EAMCET 2020 · 9 Sep · Shift 1 MCQ

The function $f(x) = x^3 - 4x^2 + 4x + 3$ defined on $[-1, 3]$ has

(A) minimum value -6 at $x = -1$
(B) minimum value 6 at $x = 3$
(C) minimum value 3 at $x = 2$
(D) maximum value 9 at $x = 3$

Answer: (A) minimum value -6 at $x = -1$ · Official TGCHE final key

Q422 TS EAMCET 2020 · 9 Sep · Shift 2 MCQ

The perpendicular distance from the origin to the normal drawn at any point on the curve $x = a(\cos\theta + \theta\sin\theta)$, $y = a(\sin\theta - \theta\cos\theta)$ is

(A) $a\theta$
(B) a^2
(C) a
(D) $\frac{a}{\theta}$

Answer: (C) a · Official TGCHE final key

Q423 TS EAMCET 2020 · 9 Sep · Shift 2 MCQ

If the semi vertical angle of a cone is 45° and its height is 20.025 cm, then the approximate value of its curved surface area (in sq.cm) is

(A) $401\pi\sqrt{2}$
(B) $\dfrac{401\sqrt{2}}{\pi}$
(C) $401\pi\sqrt{3}$
(D) $(401.2)\pi$

Answer: (A) $401\pi\sqrt{2}$ · Official TGCHE final key

Q424 TS EAMCET 2020 · 9 Sep · Shift 2 MCQ

The minimum value of the function $f(x) = 2x^2 - \ln|x|$, when $x \geq 1$ is

(A) $\dfrac{1}{2} + \log 2$
(B) 2
(C) 4
(D) $2 + \log 2$

Answer: (B) 2 · Official TGCHE final key

Q425 TS EAMCET 2019 · 6 May · Shift 1 MCQ

The coordinates of a point on the curve $x = a(\theta + \sin\theta)$, $y = a(1 - \cos\theta)$ where the tangent is inclined at an angle $\dfrac{\pi}{4}$ to the positive X-axis, are

(A) $\left(a\left(\dfrac{\pi}{2} - 1\right), a\right)$
(B) $\left(a\left(\dfrac{\pi}{2} + 1\right), a\right)$
(C) $\left(a\dfrac{\pi}{2}, a\right)$
(D) (a, a)

Answer: (B) $\left(a\left(\dfrac{\pi}{2} + 1\right), a\right)$ · Official TGCHE final key

Q426 TS EAMCET 2019 · 6 May · Shift 1 MCQ

Electric current is measured by tangent galvonometer, the current being proportional to the tangent of the angle θ of deflection. If the deflection is read as 45° and an error of 1% is made in reading it, then the percentage error in the current is

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

Answer: (B) $\frac{\pi}{2}$ · Official TGCHE final key

Q427 TS EAMCET 2019 · 4 May · Shift 1 MCQ

The approximate value of $\mathrm{Tan}^{-1}(0.999)$ (upto 4 decimal places) is

(A) 0.7852
(B) 0.7102
(C) 0.8124
(D) 0.7526

Answer: (A) 0.7852 · Official TGCHE final key

Q428 TS EAMCET 2019 · 4 May · Shift 1 MCQ

If the normal to the curve $y = f(x)$ at $(1, 2)$ makes an angle $\frac{3\pi}{4}$ with positive X-axis, then $f'(1) =$

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

Answer: (B) 1 · Official TGCHE final key

Q429 TS EAMCET 2019 · 4 May · Shift 1 MCQ

The number of real roots of the equation $e^{x-1} + \log x + x - 2 = 0$, $x \neq 0$, is

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

Answer: (B) 1 · Official TGCHE final key

Q430 TS EAMCET 2019 · 4 May · Shift 1 MCQ

Let $f : D \to \mathbb{R}$, $D \subseteq \mathbb{R}$, $c \in D$ and r be a non zero real number. Consider the following statements:
i. c is an extreme point of $f \Rightarrow c$ is an extreme point of rf
ii. c is an extreme point of $f \Rightarrow c$ is an extreme point of $r + f$
Which of the following is correct?

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(A) Only (i) is true
(B) Only (ii) is true
(C) Both (i) and (ii) are true
(D) Neither (i) nor (ii) is true

Answer: (C) Both (i) and (ii) are true · Official TGCHE final key

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Q431 TS EAMCET 2019 · 4 May · Shift 2 MCQ

If the error in measuring the side l of an equilateral triangle is 0.01, then the percentage error in the area of the triangle, in terms of its side l is

(A) $\frac{2}{l}$
(B) $\frac{3}{l}$
(C) $\frac{4}{l}$
(D) $\frac{6}{l}$

Answer: (A) $\frac{2}{l}$ · Official TGCHE final key

Q432 TS EAMCET 2019 · 4 May · Shift 2 MCQ

If at any point (x_1, y_1) on the curve $y = f(x)$, the lengths of the subtangent and subnormal are equal, then the length of the tangent drawn to that curve at that point is

(A) $2\,|y_1|$
(B) $\sqrt{2}\,|y_1|$
(C) $\sqrt{5}\,|y_1|$
(D) $\sqrt{2}\left|\frac{y_1}{x_1}\right|$

Answer: (B) $\sqrt{2}\,|y_1|$ · Official TGCHE final key

Q433 TS EAMCET 2019 · 4 May · Shift 2 MCQ

The height of a right circular cylinder is decreasing while its diameter is increasing at a rate of 4 cm/sec so as to keep its volume unchanged. The rate of change in its lateral surface area (in cm^2/sec.) at the instant when its diameter is 8 cm and height is 12 cm, is

(A) 24π
(B) -24π
(C) 48π
(D) -48π

Answer: (D) -48π · Official TGCHE final key

Q434 TS EAMCET 2019 · 4 May · Shift 2 MCQ

If $x + y = 60,\ x > 0,\ y > 0$, then the maximum value of xy^3 is

(A) $(15)^{4\frac{25}{3}}$
(B) $45\,(15)^3$
(C) $(45)^{3\frac{9}{5}}$
(D) $\frac{(45)^4}{3}$

Answer: (D) $\frac{(45)^4}{3}$ · Official TGCHE final key

Q435 TS EAMCET 2019 · 3 May · Shift 1 MCQ

The tangent of the angle between the curves $xy = 1$ and $x^2 + 8y = 0$ is

(A) $\frac{1}{7}$
(B) $\frac{2}{7}$
(C) $\frac{6}{7}$
(D) $\frac{3}{7}$

Answer: (C) $\frac{6}{7}$ · Official TGCHE final key

Q436 TS EAMCET 2019 · 3 May · Shift 1 MCQ

If $f(x) = \int_x^{x+1} e^{-t^2}\,dt$, then the interval in which $f(x)$ is decreasing is

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

Answer: (A) $\left(-\frac{1}{2}, \infty\right)$ · Official TGCHE final key

Q437 TS EAMCET 2019 · 3 May · Shift 2 MCQ

A right solid circular cylinder of given volume will have the least total surface area when

(A) its height is equal to its radius.
(B) its height is equal to its diameter.
(C) its height is independent of its radius.
(D) its height is $\frac{3}{4}$ times of its radius.

Answer: (B) its height is equal to its diameter. · Official TGCHE final key

Q438 TS EAMCET 2019 · 3 May · Shift 2 MCQ

The smaller side of the rectangle with the largest area, that can be inscribed inside a semi-circle of radius 2 units is of length

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

Answer: (D) $\sqrt{2}$ · Official TGCHE final key

Q439 TS EAMCET 2019 · 3 May · Shift 2 MCQ

Let $a, b, c \in \mathbb{R}$ be such that $2a + 3b + 6c = 0$ and $g(x)$ be the antiderivative of $f(x) = ax^2 + bx + c$. If the slopes of the tangents drawn to the curve $y = g(x)$ at $(1, g(1))$ and $(2, g(2))$ are equal, then

(A) $\frac{a}{3} = \frac{b}{-8} = \frac{c}{3}$
(B) $\frac{a}{6} = \frac{b}{-18} = \frac{c}{7}$
(C) $\frac{a}{3} = \frac{b}{-6} = \frac{c}{2}$
(D) $a = b = c = -1$

Answer: (B) $\frac{a}{6} = \frac{b}{-18} = \frac{c}{7}$ · Official TGCHE final key

Q440 TS EAMCET 2019 · 3 May · Shift 2 MCQ

Let $f(x) = (x-3)^{2018}(2-x)^{2019}$, $x \in \mathbb{R}$. If $f(\alpha)$ is a relative maximum of f at α, then $2\alpha + 3f(\alpha) =$

(A) $\frac{20186}{4037}$
(B) $\frac{20186}{4037} - 3\left(\frac{2018}{4037}\right)^{2018}\left(\frac{2019}{4037}\right)^{2019}$
(C) 6
(D) 9

Answer: (C) 6 · Official TGCHE final key

Q441 AP EAMCET 2019 · 23 Apr · Shift 1 MCQ

If T is the length of the subtangent drawn at any point on the curve $3y^2 = 4x^3$ and N is the length of the subnormal at the same point, then $(3T)^2 =$

(A) $4N^2$
(B) $4N$
(C) $2N$
(D) $8N^2$

Answer: (C) $2N$ · Official APSCHE final key

Q442 AP EAMCET 2019 · 23 Apr · Shift 1 MCQ

The interval in which the function $f(x)=\frac{\log(7+x)}{\log(3+x)}$ $(x>0)$ decreases is

(A) $\left(0,\frac{7}{3}\right)$
(B) $\left(0,\frac{3}{7}\right)$
(C) $(0,1)$
(D) $(0,\infty)$

Answer: (D) $(0,\infty)$ · Official APSCHE final key

Q443 AP EAMCET 2019 · 23 Apr · Shift 1 MCQ

In the interval $[-2,4]$, the absolute maximum of $f(x)=2x^3-3x^2-12x+5$ occurs $x=$

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

Answer: (A) 4 · Official APSCHE final key

Q444 AP EAMCET 2019 · 22 Apr · Shift 1 MCQ

Tangents are drawn to the curve $y=\sin x$ from the origin. The locus of the points of contact is

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

Answer: (B) $x^2y^2=x^2-y^2$ · Official APSCHE final key

Q445 AP EAMCET 2019 · 22 Apr · Shift 1 MCQ

A man of height 2 meters walks at a uniform speed of 7 meters per minute away from a lamp post of height 9 meters. The rate (in meters per minute) at which the length of his shadow increases is

(A) 2
(B) $\frac{5}{2}$
(C) 3
(D) $\frac{7}{2}$

Answer: (A) 2 · Official APSCHE final key

Q446 AP EAMCET 2019 · 22 Apr · Shift 1 MCQ

The maximum volume (in cubic units) of the cylinder which can be inscribed in a sphere of diameter 6 units is

(A) $12\sqrt{3}\pi$
(B) $4\sqrt{3}\pi$
(C) $3\sqrt{3}\pi$
(D) $8\sqrt{3}\pi$

Answer: (A) $12\sqrt{3}\pi$ · Official APSCHE final key

Q447 AP EAMCET 2019 · 22 Apr · Shift 2 MCQ

The angle between the curves $y^2 = 8(x+4)$ and $y^2 = 24(4-x)$ is

(A) $\text{Tan}^{-1}\left(\frac{1}{6}\right)$
(B) $\text{Tan}^{-1}(3)$
(C) $\frac{\pi}{2}$
(D) $\frac{\pi}{4}$

Answer: (C) $\frac{\pi}{2}$ · Official APSCHE final key

Q448 AP EAMCET 2019 · 22 Apr · Shift 2 MCQ

The function $f(x) = x^{1/x}$ for $x > 0$, is

(A) increasing in $(1, \infty)$
(B) decreasing in $(1, \infty)$
(C) increasing in $(1, e)$ and decreasing in (e, ∞)
(D) decreasing in $(1, e)$ and increasing in (e, ∞)

Answer: (C) increasing in $(1, e)$ and decreasing in (e, ∞) · Official APSCHE final key

Q449 AP EAMCET 2019 · 21 Apr · Shift 1 MCQ

The number of tangents to the curve $y^2(x-a) = x^2(x+a)$ $(a > 0)$ that are parallel to the X-axis is

(A) infinitely many
(B) 0
(C) 1
(D) 2

Answer: (D) 2 · Checked by our team

Q450 AP EAMCET 2019 · 21 Apr · Shift 1 MCQ

If $f(x) = (2k+1)x - 3 - ke^{-x} + 2e^{x}$ is monotonically increasing for all $x \in \mathbb{R}$, then the least value of k is

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

Answer: (B) 0 · Official APSCHE final key

Q451 AP EAMCET 2019 · 21 Apr · Shift 1 MCQ

For $a > 0$, if the function $f(x) = 2x^3 - 9ax^2 + 12a^2x + 1$ attains its maximum value at p and minimum value at q such that $p^2 = q$, then $a =$

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

Answer: (C) 2 · Official APSCHE final key

Q452 AP EAMCET 2019 · 21 Apr · Shift 2 MCQ

If $2y = 3x - 1$ is a tangent drawn to the curve $y^2 = ax^3 + b$ at $(1, 1)$ where a, b are constants, then $(a, b) =$

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

Answer: (A) $(1, 0)$ · Official APSCHE final key

Q453 AP EAMCET 2019 · 21 Apr · Shift 2 MCQ

A ladder of 5 meters long rests against a vertical wall with the lower end on the horizontal ground. The lower end of the ladder is pulled along the ground away from the wall at the rate $3\ \mathrm{m/sec}$. The height of the upper end (in meters) while it is descending at the rate of $4\ \mathrm{m/sec}$, is

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

Answer: (C) 3 · Official APSCHE final key

Q454 AP EAMCET 2019 · 21 Apr · Shift 2 MCQ

If p and q are respectively the global maximum and global minimum of the function $f(x) = x^2e^{2x}$ on the interval $[-2, 2]$, then $pe^{-4} + qe^4 =$

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(A) 0
(B) $4e^8$
(C) 4
(D) $4e^8 + 1$

Answer: (C) 4 · Official APSCHE final key

Q455 AP EAMCET 2019 · 20 Apr · Shift 1 MCQ

The time T of oscillation of a simple pendulum of length L is governed by $T = 2\pi\sqrt{\frac{L}{g}}$, where g is constant. The percentage by which the length be changed in order to correct an error of loss equal to 2 minutes of time per day is

(A) $-\frac{5}{18}$
(B) $-\frac{2}{9}$
(C) $\frac{1}{6}$
(D) $\frac{1}{9}$

Answer: (A) $-\frac{5}{18}$ · Official APSCHE final key

Q456 AP EAMCET 2019 · 20 Apr · Shift 1 MCQ

Let A, G, H and S respectively denote the arithmetic mean, geometric mean, harmonic mean and the sum of the numbers $a_1, a_2, a_3, \ldots, a_n$. Then the value of x at which the function $f(x) = \sum_{k=1}^{n}(x - a_k)^2$ has minimum is

(A) S
(B) H
(C) G
(D) A

Answer: (D) A · Official APSCHE final key

Q457 AP EAMCET 2019 · 20 Apr · Shift 1 MCQ

If the function $f : [-1, 1] \to R$ defined by $f(x) = \begin{cases} 2^x + 1, & \text{for } x \in [-1, 0) \\ 1, & \text{for } x = 0 \\ 2^x - 1, & \text{for } x \in (0, 1] \end{cases}$ then, in $[-1, 1]$, $f(x)$ has

(A) a maximum
(B) a minimum
(C) both maximum and minimum
(D) neither maximum nor minimum

Answer: (D) neither maximum nor minimum · Official APSCHE final key

Q458 AP EAMCET 2019 · 20 Apr · Shift 2 MCQ

The semivertical angle of a cone is 45°. If the height of the cone is 20.025 cm, then the approximate value of its lateral surface area (in sq.cm) is

(A) $401\sqrt{2}\,\pi$
(B) $400\sqrt{2}\,\pi$
(C) $402\sqrt{2}\,\pi$
(D) $405\sqrt{2}\,\pi$

Answer: (A) $401\sqrt{2}\,\pi$ · Official APSCHE final key

Q459 AP EAMCET 2019 · 20 Apr · Shift 2 MCQ

The radius of a sphere increases at the rate of 0.04 cm/sec. The rate of increase in the volume of that sphere with respect to its surface area, when its radius is 10 cm is

(A) 16π
(B) 25
(C) 20
(D) 5

Answer: (D) 5 · Official APSCHE final key

Q460 AP EAMCET 2019 · 20 Apr · Shift 2 MCQ

If $f(x) = a\log|x| + bx^2 + x$ has extreme values at $x = -1$ and $x = 2$, then the ordered pair $(a, b) =$

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

Answer: (B) $\left(2, -\frac{1}{2}\right)$ · Official APSCHE final key

Q461 TS EAMCET 2018 · 7 May · Shift 1 MCQ

Consider the following statements
A is relative error in the area of a square when the relative error in its side is 0.4
B is relative error in the volume of a sphere when the relative error in its radius is 0.3
C is relative error in the surface area of a closed cylinder whose height is equal to its radius, when the

relative error in its height is 0.2
D is approximate error in $y = x^2 + x - 3$ when $x = 2$ and $\delta x = 0.1$
The ascending order of the values of errors in these statements is

(A) B, C, A, D
(B) A, C, B, D
(C) C, D, A, B
(D) D, A, C, B

Answer: (C) C, D, A, B · The council's preliminary key

Q462 TS EAMCET 2018 · 7 May · Shift 1 MCQ

If the curves $\frac{x^2}{4} + \frac{y^2}{9} = 1$ and $\frac{x^2}{16} - \frac{y^2}{k} = 1$ cut each other orthogonally, then $k =$

(A) 144
(B) -9
(C) 25
(D) -21

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

Q463 TS EAMCET 2018 · 7 May · Shift 1 MCQ

If Q is the point on the parabola $y^2 = 4x$ that is nearest to the point $P(2, 0)$, then $PQ =$

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

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

Q464 TS EAMCET 2018 · 5 May · Shift 1 MCQ

The approximate value of $y = (1.01)^3 + 2(1.01)^{\frac{3}{2}} + 5$ is

(A) 8.06
(B) 8.04
(C) 8.02
(D) 8.16

Answer: (A) 8.06 · The council's preliminary key

Q465 TS EAMCET 2018 · 5 May · Shift 1 MCQ

If $y = 2x$ is a tangent to the curve $y^2 = ax^3 + b$ at $(1, 2)$, then $(a, b) =$

(A) $(8, 4)$
(B) $\left(\frac{2}{3}, 1\right)$
(C) $\left(\frac{8}{3}, \frac{4}{3}\right)$
(D) $\left(\frac{8}{3}, \frac{2}{3}\right)$

Answer: (C) $\left(\frac{8}{3}, \frac{4}{3}\right)$ · The council's preliminary key

Q466 TS EAMCET 2018 · 5 May · Shift 1 MCQ

An angle between the curves $x^2 - y^2 = 4$ and $x^2 + y^2 = 4\sqrt{2}$ is

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

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

Q467 TS EAMCET 2018 · 5 May · Shift 2 MCQ

The angle between the curves $y = \sin 2x$ and $y = \cos 2x$ is

(A) $\mathrm{Tan}^{-1}\sqrt{2}$
(B) $\mathrm{Tan}^{-1}2\sqrt{2}$
(C) $\mathrm{Tan}^{-1}\left(\frac{1}{\sqrt{2}}\right)$
(D) $\mathrm{Tan}^{-1}\left(\frac{1}{2\sqrt{2}}\right)$

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

Q468 TS EAMCET 2018 · 5 May · Shift 2 MCQ

The ratio between the length of subtangent at any point other than origin on the parabola $y^2 = 16ax$ and the abscissa of that point is

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

Answer: (D) $2 : 1$ · The council's preliminary key

Q469 TS EAMCET 2018 · 4 May · Shift 1 MCQ

If the relative errors in the base radius and the height of a cone are same and equal to 0.0[2] then the percentage error in the volume of that cone is

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(A) 2
(B) 4
(C) 6
(D) 8

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

Q470 TS EAMCET 2018 · 4 May · Shift 1 MCQ

The normal at a point θ to the curve $x = a(1 + \cos\theta)$, $y = a\sin\theta$ always passes through the fixed point

(A) $(0, a)$
(B) $(2a, 0)$
(C) $(a, 0)$
(D) (a, a)

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

Q471 TS EAMCET 2018 · 4 May · Shift 1 MCQ

If (α, β) and (γ, δ) where $\alpha < \gamma$, are the turning points of $f(x) = 2x^3 - 15x^2 + 36x -$[8] then $\alpha - \gamma - \beta + \delta =$

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

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

Q472 TS EAMCET 2018 · 4 May · Shift 1 MCQ

The height of a cylinder of the greatest volume that can be inscribed in a sphere o[f] radius 3 is

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

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

Q473 TS EAMCET 2018 · 4 May · Shift 2 MCQ

The radius of a circular plate is increasing at the rate of 0.01cm/sec. When the radius is 12cm, the rate at which the area increases is (in square cm/sec)

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(A) 60π
(B) 24π
(C) 1.2π
(D) 0.24π

Answer: (D) 0.24π · The council's preliminary key

Q474 TS EAMCET 2018 · 4 May · Shift 2 MCQ

Let $f(x) = x^2e^{-2x},\ x > 0$. The maximum value of $f(x)$ is

(A) 0
(B) $\frac{1}{e^2}$
(C) $\frac{1}{4e^2}$
(D) $\frac{1}{2e}$

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

Q475 AP EAMCET 2018 · 24 Apr · Shift 1 MCQ

If P and the origin are the points of intersection of the parabolas $y^2 = 32x$ and $2x^2 = 27y$; and if θ is the acute angle between these curves at P then $5\sqrt{\tan\theta} =$

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

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

Q476 AP EAMCET 2018 · 24 Apr · Shift 1 MCQ

If θ is an angle between the curves $x^2 + 4y = 0$ and $xy = 2$, then $\tan\theta =$

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

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

Q477 AP EAMCET 2018 · 24 Apr · Shift 1 MCQ

If the function $f(x) = x^3 + 2px^2 + 27x + 16$ is strictly increasing for all $x \in \mathbb{R}$, then the range of p is

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(A) $\left(-\infty, \frac{-9}{2}\right) \cup \left(\frac{9}{2}, \infty\right)$
(B) $(-\infty, -9) \cup (9, \infty)$
(C) $\left(\frac{-9}{2}, \frac{9}{2}\right)$
(D) $(-9, 9)$

Answer: (C) $\left(\frac{-9}{2}, \frac{9}{2}\right)$ · The council's preliminary key

Q478 AP EAMCET 2018 · 24 Apr · Shift 1 MCQ

If the distance s described in time 't' by a particle moving on a straight line is given by $s = t^5 - 40t^3 + 30t^2 + 80t - 250$, then its minimum acceleration is

(A) 260
(B) -260
(C) 130
(D) -130

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

Q479 AP EAMCET 2018 · 24 Apr · Shift 2 MCQ

If $f : \mathbb{R} \to \mathbb{R}$ be a function defined for all $x \in \mathbb{R}$ by $f(x) = x^3 + f'(1)x^2 + f''(2)x - f'''(3)$ then the area (in sq. units) of the triangle formed by X-axis, the tangent and the normal drawn to the curve $y = f(x)$ at $x = 0$ is

(A) 90
(B) 180
(C) 45
(D) 130

Answer: (C) 45 · The council's preliminary key

Q480 AP EAMCET 2018 · 24 Apr · Shift 2 MCQ

The set of values of x for which $f(x) = 3x^4 - 8x^3 - 6x^2 + 24x - 12$ is an increasing function, is

(A) $(-\infty, -1) \cup (1, 2)$
(B) $(-1, 2)$
(C) $(-1, 1) \cup (2, \infty)$
(D) $\mathbb{R}$

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

Q481 AP EAMCET 2018 · 24 Apr · Shift 2 MCQ

If $f(x) = 2x^6 - 3$ then

(A) the local minimum value of f is zero
(B) -3 is the local maximum value of f
(C) -3 is the local minimum value of f
(D) f has neither minimum nor maximum

Answer: (C) -3 **is the local minimum value of** f · The council's preliminary key

Q482 AP EAMCET 2018 · 23 Apr · Shift 1 MCQ

The area (in sq. units) of the triangle formed by the tangent and the normal at the point $\left(\frac{a}{\sqrt{2}}, \frac{b}{\sqrt{2}}\right)$ to the curve $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$ and the X-axis is

(A) $\frac{a}{b}\left(a^2+b^2\right)$
(B) $4ab$
(C) $\frac{b}{4a}\left(a^2+b^2\right)$
(D) $2ab$

Answer: (C) $\frac{b}{4a}\left(a^2+b^2\right)$ · The council's preliminary key

Q483 AP EAMCET 2018 · 23 Apr · Shift 1 MCQ

The interval in which the function $f(x)=2x^2-\log x$, for $x>0$ decreases, is

(A) $(2,4)$
(B) $\left(0,\frac{1}{4}\right)$
(C) $\left(\frac{1}{2},\infty\right)$
(D) $\left(0,\frac{1}{2}\right)$

Answer: (D) $\left(0,\frac{1}{2}\right)$ · The council's preliminary key

Q484 AP EAMCET 2018 · 23 Apr · Shift 1 MCQ

The curve $f(x)=e^x\sin x$ is defined in the interval $[0,2\pi]$. The value of x for which the slope of the tangent drawn to the curve at x is maximum, is

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

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

Q485 AP EAMCET 2018 · 23 Apr · Shift 2 MCQ

An approximate value of $\sqrt[4]{18}$ is

(A) 2.0512
(B) 2.0425
(C) 2.0625
(D) 2.0834

Answer: (C) 2.0625 · The council's preliminary key

Q486 AP EAMCET 2018 · 23 Apr · Shift 2 MCQ

The sum of the maximum and the minimum values of $3x^4 - 2x^3 - 6x^2 + 6x + 4$, in $(0, 2)$ is

(A) 28
(B) $\frac{167}{16}$
(C) $\frac{134}{15}$
(D) $\frac{87}{16}$

Answer: (B) $\frac{167}{16}$ · The council's preliminary key

Q487 AP EAMCET 2018 · 23 Apr · Shift 2 MCQ

Air is discharging from a large spherical balloon at the rate of 4 cubic meters per minute. Then the rate at which the surface area is shrinking when the radius of the balloon is 8 meters, is

(A) $2\,\mathrm{m}^2$ / minute
(B) $1\,\mathrm{m}^2$ / minute
(C) $4\,\mathrm{m}^2$ / minute
(D) $8\,\mathrm{m}^2$ / minute

Answer: (B) $1\,\mathrm{m}^2$ **/ minute** · The council's preliminary key

Q488 AP EAMCET 2018 · 22 Apr · Shift 1 MCQ

If $f(x) = x^3 + ax^2 + bx + 5\sin^2 x$ is an increasing function on $\mathbb{R}$, then

(A) $a^2 - 3b - 15 < 0$
(B) $a^2 - 3b + 15 > 0$
(C) $a^2 - 3b - 15 > 0$
(D) $a^2 + 3b + 15 > 0$

Answer: (A) $a^2 - 3b - 15 < 0$ · The council's preliminary key

Q489 AP EAMCET 2018 · 22 Apr · Shift 1 MCQ

The approximate value of $\cos 31^\circ$ is (Take $1^\circ = 0.0174$)

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(A) 0.7521
(B) 0.866
(C) 0.7146
(D) 0.8573

Answer: (D) 0.8573 · The council's preliminary key

Q490 AP EAMCET 2018 · 22 Apr · Shift 1 MCQ

If x and y are two positive numbers such that $x + y = 32$, then the minimum value of $x^2 + y^2$ is

(A) 500
(B) 256
(C) 1024
(D) 512

Answer: (D) 512 · The council's preliminary key

Q491 AP EAMCET 2018 · 22 Apr · Shift 2 MCQ

The acute angle between the tangents drawn at the point of intersection (other than the origin) of the curves $x^2 = 4y$ and $y^2 = 4x$ is

(A) $\text{Tan}^{-1}\left(\frac{1}{2}\right)$
(B) $\text{Sin}^{-1}\left(\frac{3}{5}\right)$
(C) $\text{Cos}^{-1}\left(\frac{1}{3}\right)$
(D) $\text{Tan}^{-1}\left(\frac{2}{3}\right)$

Answer: (B) $\text{Sin}^{-1}\left(\frac{3}{5}\right)$ · The council's preliminary key

Q492 AP EAMCET 2018 · 22 Apr · Shift 2 MCQ

If $x > 0$ then $\frac{x}{1+x} - \log(1+x)$

(A) is less than zero
(B) is greater than zero
(C) is equal to zero
(D) takes all the real values

Answer: (A) is less than zero · The council's preliminary key

Q493 AP EAMCET 2018 · 22 Apr · Shift 2 MCQ

If the petrol burnt in driving a motor boat varies as the cube of the velocity, then the speed (in km/hour) of the boat going against a water flow of C kms/hour so that the quantity of petrol burnt is minimum is

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

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

Q494 TS EAMCET 2017 · 12 May · Offline MCQ

If the slope of the tangent to the curve $y = ax^3 + bx + 4$ at $(2, 14)$ is 21, then the values of a and b are respectively

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

Answer: (A) $2, -3$ · The council's preliminary key

Q495 TS EAMCET 2017 · 12 May · Offline MCQ

The equation of tangent to the curve $\left(\frac{x}{a}\right)^n + \left(\frac{y}{b}\right)^n = 2$ at the point (a, b) is

(A) $\frac{x}{a} = -\frac{y}{b}$
(B) $\frac{x}{a} + \frac{y}{b} = 2$
(C) $\frac{x}{a} = \frac{y}{b}$
(D) $\frac{x}{a} + \frac{y}{b} = n$

Answer: (B) $\frac{x}{a} + \frac{y}{b} = 2$ · The council's preliminary key

Q496 TS EAMCET 2017 · 12 May · Offline MCQ

The angle between the curves $x^2 = 8y$ and $xy = 8$ is

(A) $\tan^{-1}\left(\frac{-1}{3}\right)$

(B) $\tan^{-1}(-3)$

(C) $\tan^{-1}(-\sqrt{3})$

(D) $\tan^{-1}\left(\frac{-1}{\sqrt{3}}\right)$

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

Q497 TS EAMCET 2017 · 12 May · Offline MCQ

The local maximum of $y = x^3 - 3x^2 + 5$ is attained at

(A) $x = 0$

(B) $x = 2$

(C) $x = 1$

(D) $x = -1$

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

Q498 AP EAMCET 2017 · 26 Apr · Shift 1 MCQ

An angle between the curves $x^2 = 3y$ and $x^2 + y^2 = 4$ is

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

(B) $\tan^{-1}\frac{2}{\sqrt{3}}$

(C) $\tan^{-1}\frac{5}{\sqrt{3}}$

(D) $\tan^{-1}\sqrt{\frac{5}{3}}$

Answer: (C) $\tan^{-1}\frac{5}{\sqrt{3}}$ · The council's preliminary key

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Q499 AP EAMCET 2017 · 26 Apr · Shift 1 MCQ

A container is in the shape of an inverted cone. Its height is 6m and radius is 4m at the top. If it is filled with water at the rate of $3\,\mathrm{m}^3/\mathrm{min}$, then the rate of change of height of water (in mt/min) when the water level is 3m, is

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

(B) $\frac{2}{9\pi}$

(C) 16π

(D) 2π

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

Q500 AP EAMCET 2017 · 26 Apr · Shift 1 MCQ

If a cylindrical vessel of given volume V with no lid on the top is to be made from a sheet of metal, then the radius (r) and height (h) of the vessel so that the metal sheet used is minimum, is

(A) $r = \sqrt[3]{\frac{V}{\pi}},\ h = \sqrt[3]{\frac{V}{\pi}}$

(B) $r = \sqrt{\frac{V}{\pi}},\ h = \sqrt{\frac{V}{\pi}}$

(C) $r = \sqrt{\pi V},\ h = \sqrt{\pi V}$

(D) $r = \sqrt[3]{\frac{\pi}{V}},\ h = \sqrt[3]{\frac{\pi}{V}}$

Answer: (A) $r = \sqrt[3]{\frac{V}{\pi}},\ h = \sqrt[3]{\frac{V}{\pi}}$ · The council's preliminary key

Q501 AP EAMCET 2017 · 26 Apr · Shift 2 MCQ

An angle between the curves $x^2y = 1$ and $y(x^2 + 1) = 2$ is

(A) $\mathrm{Tan}^{-1}\frac{8}{9}$

(B) $\mathrm{Tan}^{-1}2$

(C) $\mathrm{Tan}^{-1}\frac{1}{2}$

(D) $\mathrm{Tan}^{-1}\frac{1}{3}$

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

Q502 AP EAMCET 2017 · 26 Apr · Shift 2 MCQ

The function $f(x) = x \cdot e^{x(1-x)}$ is

(A) increasing in $\left[-\frac{1}{2}, 1\right]$

(B) decreasing in $\left[-\frac{1}{2}, 1\right]$

(C) increasing in $\mathbb{R}$

(D) decreasing in $\mathbb{R}$

Answer: (A) increasing in $\left[-\frac{1}{2}, 1\right]$ · The council's preliminary key

Q503 AP EAMCET 2017 · 26 Apr · Shift 2 MCQ

A manufacturer can sell x items at a price of rupees $\left(5 - \frac{x}{100}\right)$ each. The cost price of x items is Rs. $\left(\frac{x}{5} + 500\right)$. The number of items that the manufacturer should sell to earn the maximum profit is

(A) 230
(B) 240
(C) 260
(D) 376

Answer: (B) 240 · The council's preliminary key

Q504 AP EAMCET 2017 · 25 Apr · Shift 1 MCQ

If $ab \neq 0$, then the equation of the tangent at (a, b) to the curve $\left(\frac{x}{a}\right)^n + \left(\frac{y}{b}\right)^n = 2$ is

(A) $\frac{x}{a} + \frac{y}{b} = 1$
(B) $ax + by = 1$
(C) $\frac{x}{a} + \frac{y}{b} = 2$
(D) $ax + by = 2n$

Answer: (C) $\frac{x}{a} + \frac{y}{b} = 2$ · The council's preliminary key

Q505 AP EAMCET 2017 · 25 Apr · Shift 1 MCQ

A particle is moving along a line according to the law $S = t^3 - 3t^2 + 4t - 2$ where S is measured in metres and t is measured in seconds. Then the velocity (in mt/sec) of the particle when its acceleration is zero is

(A) 2
(B) $\frac{1}{4}$
(C) $\frac{17}{4}$
(D) 1

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

Q506 AP EAMCET 2017 · 25 Apr · Shift 1 MCQ

The greatest value of the real-valued function $f(x) = (x+1)^{1/3} - (x-1)^{1/3}$ on $[0, 1]$ is

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

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

Q507 AP EAMCET 2017 · 25 Apr · Shift 2 MCQ

If the normal to the curve $x^{2/3} + y^{2/3} = a^{2/3}$ makes an angle ϕ with the X - axis, then the equation of that normal is

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(A) $y - a\cos^2\phi = x\tan\phi - a^2\sin^2\phi$

(B) $y\cos\phi - x\sin\phi = a\cos 2\phi$

(C) $y\cos\phi - x\sin\phi = a\cos^2\phi$

(D) $y + a\sin^2\phi = x\cos\phi - a\sin 2\phi$

Answer: (B) $y\cos\phi - x\sin\phi = a\cos 2\phi$ · The council's preliminary key

Q508 AP EAMCET 2017 · 25 Apr · Shift 2 MCQ

If the rate of change of x is more than the rate of change of y on the curve $x^3 = 12y$, $(x > 0)$, then x lies in the interval

(A) $(-2, 0) \cup (0, 2)$

(B) $(-2, 2)$

(C) $[-3, 3]$

(D) $(0, 2)$

Answer: (D) $(0, 2)$ · The council's preliminary key

Q509 AP EAMCET 2017 · 25 Apr · Shift 2 MCQ

If $0 < x < \frac{\pi}{2}$ then the maximum area (in sq. units) of the triangle whose vertices are $(0, 0)$, $(x, \cos x)$ and $(\sin^3 x, 0)$ is

(A) $\frac{3\sqrt{3}}{32}$

(B) $\frac{7\sqrt{3}}{32}$

(C) $\frac{5\sqrt{3}}{32}$

(D) $\frac{3\sqrt{3}}{16}$

Answer: (A) $\frac{3\sqrt{3}}{32}$ · The council's preliminary key

Q510 AP EAMCET 2017 · 24 Apr · Shift 1 MCQ

At any point for the curve $3y^2 = (x + 5)^3$, if ST represents the length of the subtangent and SN represents the length of the subnormal then $9(ST)^2 =$

(A) 8 SN

(B) $\frac{8}{3}$ SN

(C) 27 SN

(D) $8\ (\text{SN})^2$

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

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Q511 AP EAMCET 2017 · 24 Apr · Shift 1 MCQ

Let a kind of bacteria grow following the function $f(t) = t^4$, t given in seconds. If the rate of growth of the bacteria after t_0 seconds is 4000/second, then $t_0 =$

(A) 0
(B) 10
(C) 20
(D) 30

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

Q512 AP EAMCET 2017 · 24 Apr · Shift 1 MCQ

The radius (in cms) of the right circular cylinder of greatest curved surface area which can be inscribed in a given cone with radius 10cm is

(A) $\frac{\pi}{5}$
(B) 5π
(C) 20
(D) 5

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

Q513 AP EAMCET 2017 · 24 Apr · Shift 2 MCQ

The length of the normal to the curve $x = a(\theta + \sin\theta)$, $y = a(1 - \cos\theta)$ at $\theta = \frac{\pi}{2}$ is

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

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

Q514 AP EAMCET 2017 · 24 Apr · Shift 2 MCQ

Each edge of a cube is expanding at the rate of 1cm/sec. Then the rate (in cc/sec.) of change in its volume, when each of its edge is of length 5cm is

(A) 25
(B) 75
(C) 125
(D) 175

Answer: (B) 75 · The council's preliminary key

Q515 AP EAMCET 2017 · 24 Apr · Shift 2 MCQ

The shortest distance between the line $y - x = 1$ and the curve $x = y^2$ is

(A) $\frac{2\sqrt{3}}{8}$
(B) $\frac{3\sqrt{2}}{5}$
(C) $\frac{\sqrt{3}}{4}$
(D) $\frac{3\sqrt{2}}{8}$

Answer: (D) $\frac{3\sqrt{2}}{8}$ · The council's preliminary key

Q516 TS EAMCET 2016 · 15 May · Offline MCQ

The length of the segment of the tangent line to the curve $x = a\cos^3 t$, $y = a\sin^3 t$, at any point on the curve cut off by the coordinate axes is

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

Answer: (B) a · Official TGCHE final key

Q517 TS EAMCET 2016 · 15 May · Offline MCQ

The area of the triangle formed by the positive x-axis, the tangent and normal to the curve $x^2 + y^2 = 16a^2$ at the point $(2\sqrt{2}a, 2\sqrt{2}a)$ is

(A) a^2
(B) $16a^2$
(C) $4a^2$
(D) $8a^2$

Answer: (D) $8a^2$ · Official TGCHE final key

Q518 TS EAMCET 2016 · 15 May · Offline MCQ

Define $f(x) = \frac{1}{2}[|\sin x| + \sin x]$, $0 < x \leq 2\pi$. Then, f is

(A) increasing in $\left(\frac{\pi}{2}, \frac{3\pi}{2}\right)$
(B) decreasing in $\left(0, \frac{\pi}{2}\right)$ and increasing in $\left(\frac{\pi}{2}, \pi\right)$
(C) increasing in $\left(0, \frac{\pi}{2}\right)$ and decreasing in $\left(\frac{\pi}{2}, \pi\right)$
(D) increasing in $\left(0, \frac{\pi}{4}\right)$ and decreasing in $\left(\frac{\pi}{4}, \pi\right)$

Answer: (C) increasing in $\left(0, \frac{\pi}{2}\right)$ and decreasing in $\left(\frac{\pi}{2}, \pi\right)$ · Official TGCHE final key

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Q519 TS EAMCET 2016 · 15 May · Offline MCQ

The smallest value of the constant $m > 0$ for which $f(x) = 9mx - 1 + \frac{1}{x} \geq 0$ for all $x > 0$, is

(A) $\frac{1}{9}$
(B) $\frac{1}{16}$
(C) $\frac{1}{36}$
(D) $\frac{1}{81}$

Answer: (C) $\frac{1}{36}$ · Official TGCHE final key

Q520 AP EAMCET 2016 · 29 Apr · Offline MCQ

The angle of intersection between the curves $y^2 + x^2 = a^2\sqrt{2}$ and $x^2 - y^2 = a^2$, is

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

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

Q521 AP EAMCET 2014 · 22 May · Offline MCQ

If the curves $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ and $\frac{x^2}{25} + \frac{y^2}{16} = 1$ cut each other orthogonally, then $a^2 - b^2 =$

(A) 9
(B) 400
(C) 75
(D) 41

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

Q522 AP EAMCET 2014 · 22 May · Offline MCQ

The condition that $f(x) = ax^3 + bx^2 + cx + d$ has no extreme value is

(A) $b^2 > 3ac$
(B) $b^2 = 4ac$
(C) $b^2 = 3ac$
(D) $b^2 < 3ac$

Options (3) or (4) were accepted. More than one answer was accepted. · The council's preliminary key

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Q523 AP EAMCET 2014 · 22 May · Offline MCQ

If there is an error of ± 0.04 cm in the measurement of the diameter of a sphere then the approximate percentage error in its volume, when the radius is 10 cm, is

(A) ± 1.2
(B) ± 0.06
(C) ± 0.006
(D) ± 0.6

Answer: (D) ± 0.6 · The council's preliminary key

Q524 AP EAMCET 2013 · 10 May · Offline MCQ

The relation between pressure p and volume v is given by $pv^{\frac{1}{4}} =$ Constant. If the percentage decrease in volume is $\frac{1}{2}$, then the percentage increase in pressure is

(A) $-\frac{1}{8}$
(B) $\frac{1}{16}$
(C) $\frac{1}{8}$
(D) $\frac{1}{2}$

Answer: (C) $\frac{1}{8}$ · The council's preliminary key

Q525 AP EAMCET 2013 · 10 May · Offline MCQ

If the curves $x^2 + py^2 = 1$ and $qx^2 + y^2 = 1$ are orthogonal to each other, then

(A) $p - q = 2$
(B) $\frac{1}{p} - \frac{1}{q} = 2$
(C) $\frac{1}{p} + \frac{1}{q} = -2$
(D) $\frac{1}{p} + \frac{1}{q} = 2$

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

Q526 AP EAMCET 2013 · 10 May · Offline MCQ

The focal length of a mirror is given by $\frac{2}{f} = \frac{1}{v} - \frac{1}{u}$. In finding the values of u and v, the errors are equal and equal to p. Then, the relative error in f is

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(A) $\frac{p}{2}\left(\frac{1}{u}+\frac{1}{v}\right)$
(B) $p\left(\frac{1}{u}+\frac{1}{v}\right)$
(C) $\frac{p}{2}\left(\frac{1}{u}-\frac{1}{v}\right)$
(D) $p\left(\frac{1}{u}-\frac{1}{v}\right)$

Answer: (B) $p\left(\frac{1}{u}+\frac{1}{v}\right)$ · The council's preliminary key

Q527 AP EAMCET 2012 · 12 May · Offline MCQ

The coordinates of the point P on the curve $x=a(\theta+\sin\theta)$, $y=a(1-\cos\theta)$ where the tangent is inclined at an angle $\frac{\pi}{4}$ to the x-axis, are

(A) $\left(a\left(\frac{\pi}{2}-1\right),a\right)$
(B) $\left(a\left(\frac{\pi}{2}+1\right),a\right)$
(C) $\left(a\frac{\pi}{2},a\right)$
(D) (a,a)

Answer: (B) $\left(a\left(\frac{\pi}{2}+1\right),a\right)$ · Official APSCHE final key

Q528 AP EAMCET 2012 · 12 May · Offline MCQ

If Δ is the area of the triangle formed by the positive x-axis and the normal and tangent to the circle $x^2+y^2=4$ at $(1,\sqrt{3})$, then $\Delta=$

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

Answer: (C) $2\sqrt{3}$ · Official APSCHE final key

Q529 AP EAMCET 2012 · 12 May · Offline MCQ

If the volume of a sphere increases at the rate of $2\pi\ \mathrm{cm}^3/\mathrm{sec}$, then the rate of increase of its radius (in cm/sec), when the volume is $288\pi\ \mathrm{cm}^3$ is

(A) $\frac{1}{36}$
(B) $\frac{1}{72}$
(C) $\frac{1}{18}$
(D) $\frac{1}{9}$

Answer: (B) $\frac{1}{72}$ · Official APSCHE final key

Q530 AP EAMCET 2011 · 8 May · Offline MCQ

If $1^\circ = \alpha$ radians then the approximate value of $\cos(60^\circ\, 1')$ is

(A) $\frac{1}{2} + \frac{\alpha\sqrt{3}}{120}$
(B) $\frac{1}{2} - \frac{\alpha}{120}$
(C) $\frac{1}{2} - \frac{\alpha\sqrt{3}}{120}$
(D) $\frac{1}{2} + \frac{\alpha}{120}$

Answer: (C) $\frac{1}{2} - \frac{\alpha\sqrt{3}}{120}$ · The council's preliminary key

Q531 AP EAMCET 2011 · 8 May · Offline MCQ

The length of the subtangent at any point (x_1, y_1) on the curve $y = 5^x$ is

(A) 5^{x_1}
(B) $y_1 \cdot 5^{x_1}$
(C) $\log_e 5$
(D) $\frac{1}{\log_e 5}$

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

Q532 AP EAMCET 2010 · 30 May · Offline MCQ

The height of the cone of maximum volume inscribed in a sphere of radius R is :

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

Answer: (C) $\frac{4R}{3}$ · Official APSCHE final key

Q533 AP EAMCET 2010 · 30 May · Offline MCQ

The longest distance of the point $(a, 0)$ from the curve $2x^2 + y^2 = 2x$ is :

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

Answer: (C) $\sqrt{1 - 2a + 2a^2}$ · Official APSCHE final key

Q534 AP EAMCET 2010 · 30 May · Offline MCQ

A variable triangle ABC is inscribed in a circle of diameter x units. At a particular instant, the rate of change in side a is $\frac{x}{2}$ times the rate of change in its opposite angle A. Then $\mathrm{A} =$

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

Answer: (B) $\frac{\pi}{3}$ · Official APSCHE final key

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