EdLoop

EdLoop JEE

MATHEMATICS · JEE MAIN

Area Under Curves

Previous Year Questions with answers

178 questions · **171** papers · **2002–2026** · newest paper first

Step-by-step solutions for every question: free in the EdLoop JEE app (Google Play) · pyq.edloop.in

What is in this PDF: every Area Under Curves question we hold from past JEE Main and AIEEE papers, with its options and answer. Where an answer comes from a source other than the official final key, it says so next to the answer.

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

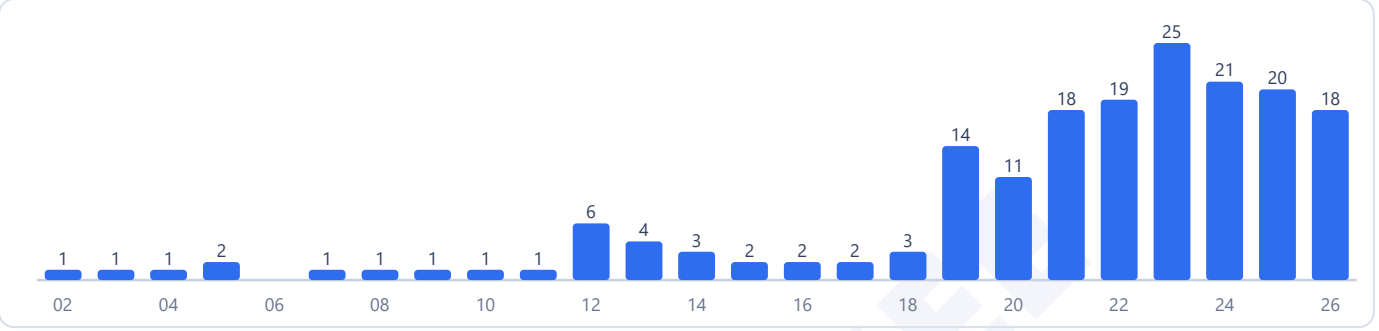
EdLoop

Chapter at a glance

3.2%	178	141 of 162	133 / 45
of Mathematics questions, 2019–2026	questions, 2002–2026	papers asked it, 2019–2026	MCQ / numerical, 2002–2026

Trend. Steady: 1 questions per paper in 2024–2026 against 0.8 in 2019–2023.

Questions per year



Counts are the questions we hold: 178 in 171 papers. No question in this chapter was found repeated across papers.

Most-asked topics in this chapter (2002–2026)

Area Bounded by Curves	**178**

How often it comes up

Area under curves combines curve-sketching with definite integration under Unit 8: Integral Calculus in the Class 12 curriculum, placing it at rank 18 among the 29 chapters in the subject. Between 2019 and 2026, 146 questions were set from this chapter across 162 papers, representing 3.2 percent of all mathematics questions. It appeared in 141 of those 162 papers and has been tested every single year since 2019. In the recent 2024 to 2026 testing window, it generated 59 questions across 58 papers, averaging 1.0 question per paper and capturing a 3.8 percent subject share. Comparing its 2.4 percent share during the 2002 to 2018 period against 2024 to 2026, its share is up, and comparing 2019 to 2026 against 2024 to 2026 also shows it is up. Over the full 2002 to 2026 historical record of 200 papers, 178 questions were asked across 171 papers, including 45 numerical answer questions between 2019 and 2026.

The question volumes across 2024, 2025, and 2026 were 21, 20, and 18 questions respectively, showing steady presence.

Because calculating a bounded planar area requires solving simultaneous equations for intersection coordinates and setting up definite integrals across appropriate limits, this chapter functions as a comprehensive checkpoint for curve sketching and integral evaluation. Furthermore, area questions frequently appear in the numerical section.

Most-asked topics

All problems in this chapter fall under a unified core curriculum:

1. **Area Bounded by Curves (146 questions, 2019-2026; 178 total, last asked 2026)** The sole classification encompasses every exam problem in this domain. Sub-types include:

- Regions enclosed between parabolas and intersecting straight lines.
- Regions bounded between circles, ellipses, and intersecting parabolas.
- Inequalities defining planar subsets involving absolute value boundaries.
- Symmetric regions bounded between trigonometric curves and polynomials.

- Horizontal slicing formulations where integrating with respect to y is significantly simpler than integrating with respect to x.

What the questions look like

Examiners test bounded area using recurring geometric formats:

- **Set-Theoretic Inequality Specifications**: The target region is presented as a set of coordinate pairs satisfying simultaneous algebraic inequalities, such as a quadratic boundary and a linear boundary, requiring students to shade and isolate the valid intersection.
- **Conic and Modulus Intersections**: Regions lying inside an ellipse or circle while simultaneously remaining outside a square oriented with vertices along the coordinate axes.
- **Parabola and Line Partitioning**: A parabola is sliced by a line passing through given intercepts, and the problem asks for the area enclosed between them or the ratio into which a vertical line divides the region.
- **Symmetric Two-Curve Enclosures**: Finding the common area enclosed between two orthogonal parabolas or between an inverted parabola and a modulus V-shape.

How to practise it

Accurate area calculation requires visualising the geometry before integrating:

- **Sketch the curves immediately**: Always draw a quick rough sketch showing the orientations, axes of symmetry, and vertices of the intersecting curves. Visually identify the enclosed area to avoid integrating over the wrong branch or missing disconnected lobes.
- **Compute intersection points precisely**: Equate the equations of the bounding curves and solve for their intersection points. Double-check extraneous roots, particularly when squaring equations or handling piecewise absolute value functions.
- **Choose the integration axis wisely**: Decide whether integrating with respect to x or y yields a simpler calculation. If a horizontal strip connects a single left curve to a single right curve throughout the region, integrating with respect to y eliminates the need to split the integral into multiple piecewise intervals.
- **Exploit geometric symmetry**: If a region possesses symmetry about the coordinate axes or the origin, compute the area of one symmetric sector and scale it appropriately. This reduces computational workload and lowers the chance of sign mistakes during limit substitution.

EdLoop JEE

Q1 JEE Main 2026 · 8 Apr · Shift 2 MCQ

Let $f:(1,\infty)\to\mathbf{R}$ be a function defined as $f(x)=\dfrac{x-1}{x+1}$. Let $f^{i+1}(x)=f\left(f^{i}(x)\right)$, $i=1,2,\ldots,25$, where $f^{1}(x)=f(x)$. If $g(x)+f^{26}(x)=0$, $x\in(1,\infty)$, then the area of the region bounded by the curves $y=g(x)$, $2y=2x-3$, $y=0$ and $x=4$ is :

(A) $\dfrac{1}{8}+\log_e 2$

(B) $\dfrac{1}{4}+\log_e 2$

(C) $\dfrac{5}{6}+3\log_e 2$

(D) $\dfrac{5}{6}+\log_e 2$

Answer: (A) $\dfrac{1}{8}+\log_e 2$ · Official NTA final key

Q2 JEE Main 2026 · 6 Apr · Shift 1 MCQ

The area of the region $\{(x,y):0\le y\le 6-x,\ y^2\ge 4x-3,\ x\ge 0\}$ is:

(A) 8

(B) 9

(C) 12

(D) 15

Answer: (B) 9 · Official NTA final key

Q3 JEE Main 2026 · 6 Apr · Shift 2 MCQ

The area of the region $\{(x,y):x^2-8x\le y\le -x\}$ is :

(A) $\dfrac{343}{6}$

(B) $\dfrac{637}{6}$

(C) $\dfrac{437}{6}$

(D) $\dfrac{523}{6}$

Answer: (A) $\dfrac{343}{6}$ · Official NTA final key

Q4 JEE Main 2026 · 5 Apr · Shift 1 MCQ

The area of the region $\mathrm{R}=\{(x,y):xy\le 27,\ 1\le y\le x^2\}$ is equal to:

(A) $78\log_e 3 - \frac{52}{3}$
(B) $54\log_e 3 - \frac{52}{3}$
(C) $54\log_e 3 - \frac{26}{3}$
(D) $54\log_e 3 + \frac{26}{3}$

Answer: (B) $54\log_e 3 - \frac{52}{3}$ · Official NTA final key

---

Q5 JEE Main 2026 · 5 Apr · Shift 2 Numerical

Let $f : \mathbf{R} \to \mathbf{R}$ be a function such that $f(x) + 3f\left(\frac{\pi}{2} - x\right) = \sin x$, $x \in \mathbf{R}$. Let the maximum value of f on $\mathbf{R}$ be α. If the area of the region bounded by the curves $g(x) = x^2$ and $h(x) = \beta x^3$, $\beta > 0$, is α^2, then $30\beta^3$ is equal to _____.

Numerical value type: the answer is a number.

Answer: 16. · Official NTA final key

Q6 JEE Main 2026 · 4 Apr · Shift 1 MCQ

The area of the region $\{(x, y) : y \le \pi - |x|,\ y \le |x \sin x|,\ y \ge 0\}$ is:

(A) $1 + \frac{\pi^2}{8}$
(B) $2 + \frac{\pi^2}{4}$
(C) $\frac{\pi^2}{8} - 1$
(D) $4 + \frac{\pi^2}{2}$

Answer: (B) $2 + \frac{\pi^2}{4}$ · Official NTA final key

Q7 JEE Main 2026 · 4 Apr · Shift 2 MCQ

The area of the region bounded by the curves $x + 3y^2 = 0$ and $x + 4y^2 = 1$ is equal to:

(A) $\frac{1}{3}$
(B) $\frac{2}{3}$
(C) $\frac{4}{3}$
(D) $\frac{5}{3}$

Answer: (C) $\frac{4}{3}$ · Official NTA final key

Q8 JEE Main 2026 · 2 Apr · Shift 2 Numerical

If the area of the region bounded by $16x^2 - 9y^2 = 144$ and $8x - 3y = 24$ is A, then $3(\mathrm{A} + 6\log_e(3))$ is equal to _____.

Numerical value type: the answer is a number.

Answer: 24. · Official NTA final key

Q9 JEE Main 2026 · 28 Jan · Shift 1 MCQ

The area of the region $R = \{(x, y) : xy \leq 8,\ 1 \leq y \leq x^2,\ x \geq 0\}$ is

(A) $\frac{2}{3}(20\log_e(2) + 9)$
(B) $\frac{1}{3}(40\log_e(2) + 27)$
(C) $\frac{1}{3}(49\log_e(2) - 15)$
(D) $\frac{2}{3}(24\log_e(2) - 7)$

Answer: (D) $\frac{2}{3}(24\log_e(2) - 7)$ · Official NTA final key

Q10 JEE Main 2026 · 28 Jan · Shift 2 MCQ

Let $P_1 : y = 4x^2$ and $P_2 : y = x^2 + 27$ be two parabolas. If the area of the bounded region enclosed between P_1 and P_2 is six times the area of the bounded region enclosed between the line $y = \alpha x$, $\alpha > 0$ and P_1, then α is equal to :

(A) 8
(B) 15
(C) 6
(D) 12

Answer: (D) 12 · Official NTA final key

Q11 JEE Main 2026 · 24 Jan · Shift 1 MCQ

Let A_1 be the bounded area enclosed by the curves $y = x^2 + 2$, $x + y = 8$ and y-axis that lies in the first quadrant. Let A_2 be the bounded area enclosed by the curves $y = x^2 + 2$, $y^2 = x$, $x = 2$, and y-axis that lies in the first quadrant. Then $A_1 - A_2$ is equal to

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

Answer: (C) $\frac{2}{3}(2\sqrt{2} + 1)$ · Official NTA final key

Q12 JEE Main 2026 · 24 Jan · Shift 2 MCQ

Let $f(\alpha)$ denote the area of the region in the first quadrant bounded by $x = 0$, $x = 1$, $y^2 = x$ and $y = |\alpha x - 5| - |1 - \alpha x| + \alpha x^2$. Then $(f(0) + f(1))$ is equal to

(A) 12
(B) 9
(C) 7
(D) 14

Answer: (C) 7 · Official NTA final key

Q13 JEE Main 2026 · 23 Jan · Shift 1 · Numerical

Let the area of the region bounded by the curve $y = \max\{\sin x, \cos x\}$, lines $x = 0$, $x = \frac{3\pi}{2}$, and the x-axis be A. Then, $A + A^2$ is equal to _____.

Numerical value type: the answer is a number.

Answer: 12. · Official NTA final key

Q14 JEE Main 2026 · 23 Jan · Shift 2 · MCQ

The area of the region enclosed between the circles $x^2 + y^2 = 4$ and $x^2 + (y-2)^2 = 4$ is:

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

Answer: (B) $\frac{2}{3}\left(4\pi - 3\sqrt{3}\right)$ · Official NTA final key

Q15 JEE Main 2026 · 22 Jan · Shift 1 · MCQ

Let the line $x = -1$ divide the area of the region $\{(x, y) : 1 + x^2 \le y \le 3 - x\}$ in the ratio $m : n$, $\gcd(m, n) = 1$. Then $m + n$ is equal to

(A) 27
(B) 26
(C) 25
(D) 28

Answer: (A) 27 · Official NTA final key

Q16 JEE Main 2026 · 22 Jan · Shift 2 · MCQ

The area of the region $A = \{(x, y) : 4x^2 + y^2 \le 8 \text{ and } y^2 \le 4x\}$ is :

EdLoop JEE

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

Answer: (C) $\pi+\frac{2}{3}$ · Official NTA final key

Q17 JEE Main 2026 · 21 Jan · Shift 1 MCQ

The area of the region, inside the ellipse $x^2+4y^2=4$ and outside the region bounded by the curves $y=|x|-1$ and $y=1-|x|$, is :

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

Answer: (C) $2(\pi-1)$ · Official NTA final key

Q18 JEE Main 2026 · 21 Jan · Shift 2 MCQ

If the area of the region $\{(x,y): 1-2x \le y \le 4-x^2, x \ge 0, y \ge 0\}$ is $\frac{\alpha}{\beta}$, $\alpha,\beta \in \mathbf{N}$, $\gcd(\alpha,\beta)=1$, then the value of $(\alpha+\beta)$ is :

(A) 67
(B) 85
(C) 91
(D) 73

Answer: (D) 73 · Official NTA final key

Q19 JEE Main 2025 · 8 Apr · Shift 2 Numerical

Let the area of the bounded region $\{(x,y): 0 \le 9x \le y^2, y \ge 3x-6\}$ be A. Then $6A$ is equal to _____.

Numerical value type: the answer is a number.

Answer: 15. · Key from source paper

Q20 JEE Main 2025 · 7 Apr · Shift 1 MCQ

If the area of the region bounded by the curves $y=4-\frac{x^2}{4}$ and $y=\frac{x-4}{2}$ is equal to α, then 6α equals

(A) 250
(B) 220
(C) 240
(D) 210

Answer: (A) 250 · Key from source paper

Q21 JEE Main 2025 · 7 Apr · Shift 2 MCQ

If the area of the region $\{(x, y) : 1 + x^2 \leqslant y \leqslant \min\{x + 7, 11 - 3x\}\}$ is A , then 3 A is equal to

(A) 46
(B) 47
(C) 49
(D) 50

Answer: (D) 50 · Key from source paper

Q22 JEE Main 2025 · 4 Apr · Shift 1 Numerical

If the area of the region $\{(x, y) : |x - 5| \leq y \leq 4\sqrt{x}\}$ is A , then 3A is equal to _____

Numerical value type: the answer is a number.

Answer: 368. · Key from source paper

Q23 JEE Main 2025 · 4 Apr · Shift 2 MCQ

A line passing through the point $A(-2, 0)$, touches the parabola $P : y^2 = x - 2$ at the point B in the first quadrant. The area, of the region bounded by the line AB, parabola P and the x -axis, is :

(A) $\frac{7}{3}$
(B) $\frac{8}{3}$
(C) 3
(D) 2

Answer: (B) $\frac{8}{3}$ · Key from source paper

Q24 JEE Main 2025 · 3 Apr · Shift 1 Numerical

The area of the region bounded by the curve $y = \max\{|x|, x|x - 2|\}$, the x -axis and the lines $x = -2$ and $x = 4$ is equal to _____ .

Numerical value type: the answer is a number.

Answer: 12. · Key from source paper

Q25 JEE Main 2025 · 3 Apr · Shift 2 MCQ

The area of the region $\{(x, y) : |x - y| \leq y \leq 4\sqrt{x}\}$ is

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

Answer: (C) $\frac{1024}{3}$ · Key from source paper

Q26 JEE Main 2025 · 2 Apr · Shift 1 · Numerical

If the area of the region $\{(x, y) : |4 - x^2| \leq y \leq x^2, y \leq 4, x \geq 0\}$ is $\left(\frac{80\sqrt{2}}{\alpha} - \beta\right), \alpha, \beta \in N$, then $\alpha + \beta$ is equal to _____.

Numerical value type: the answer is a number.

Answer: 22. · Key from source paper

Q27 JEE Main 2025 · 29 Jan · Shift 1 · MCQ

Let the area of the region $\{(x, y) : 2y \leq x^2 + 3, y + |x| \leq 3, y \geqslant |x - 1|\}$ be A. Then 6 A is equal to :

(A) 16
(B) 12
(C) 14
(D) 18

Answer: (C) 14 · Key from source paper

Q28 JEE Main 2025 · 29 Jan · Shift 2 · MCQ

Let the area enclosed between the curves $|y| = 1 - x^2$ and $x^2 + y^2 = 1$ be α. If $9\alpha = \beta\pi + \gamma$; β, γ are integers, then the value of $|\beta - \gamma|$ equals.

(A) 27
(B) 33
(C) 15
(D) 18

Answer: (B) 33 · Key from source paper

Q29 JEE Main 2025 · 28 Jan · Shift 1 · MCQ

The area (in sq. units) of the region $\{(x, y) : 0 \leq y \leq 2|x| + 1, 0 \leq y \leq x^2 + 1, |x| \leq 3\}$ is

EdLoop JEE

(A) $\frac{80}{3}$
(B) $\frac{64}{3}$
(C) $\frac{32}{3}$
(D) $\frac{17}{3}$

Answer: (B) $\frac{64}{3}$ · Key from source paper

Q30 JEE Main 2025 · 28 Jan · Shift 2 MCQ

The area of the region bounded by the curves $x\left(1+y^2\right)=1$ and $y^2=2x$ is:

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

Answer: (B) $\frac{\pi}{2}-\frac{1}{3}$ · Key from source paper

---

Q31 JEE Main 2025 · 24 Jan · Shift 1 MCQ

The area of the region $\{(x,y): x^2+4x+2 \le y \le |x+2|\}$ is equal to

(A) 7
(B) 5
(C) 24/5
(D) 20/3

Answer: (D) 20/3 · Key from source paper

Q32 JEE Main 2025 · 24 Jan · Shift 2 MCQ

The area of the region enclosed by the curves $y=\mathrm{e}^x, y=|\mathrm{e}^x-1|$ and y-axis is:

(A) $1-\log_e 2$
(B) $\log_e 2$
(C) $1+\log_e 2$
(D) $2\log_e 2-1$

Answer: (A) $1-\log_e 2$ · Key from source paper

Q33 JEE Main 2025 · 23 Jan · Shift 1 Numerical

If the area of the larger portion bounded between the curves $x^2+y^2=25$ and $y=|x-1|$ is $\frac{1}{4}(b\pi+c)$, $b,c\in N$, then $b+c$ is equal to _____

Numerical value type: the answer is a number.

Answer: 77. · Key from source paper

Q34 JEE Main 2025 · 23 Jan · Shift 2 MCQ

If the area of the region $\{(x, y) : -1 \leq x \leq 1, 0 \leq y \leq a + e^{|x|} - e^{-x}, a > 0\}$ is $\frac{e^2+8e+1}{e}$, then the value of a is :

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

Answer: (C) 5 · Key from source paper

Q35 JEE Main 2025 · 22 Jan · Shift 1 MCQ

Let $f : \mathbf{R} \to \mathbf{R}$ be a twice differentiable function such that $f(x + y) = f(x)f(y)$ for all $x, y \in \mathbf{R}$. If $f'(0) = 4a$ and f satisfies $f''(x) - 3af'(x) - f(x) = 0$, $a > 0$, then the area of the region $R = \{(x, y) \mid 0 \leq y \leq f(ax), 0 \leq x \leq 2\}$ is :

(A) $e^2 - 1$
(B) $e^2 + 1$
(C) $e^4 + 1$
(D) $e^4 - 1$

Answer: (A) $e^2 - 1$ · Key from source paper

Q36 JEE Main 2025 · 22 Jan · Shift 1 MCQ

The area of the region, inside the circle $\left(x - 2\sqrt{3}\right)^2 + y^2 = 12$ and outside the parabola $y^2 = 2\sqrt{3}x$ is :

(A) $3\pi + 8$
(B) $6\pi - 16$
(C) $3\pi - 8$
(D) $6\pi - 8$

Answer: (B) $6\pi - 16$ · Key from source paper

Q37 JEE Main 2025 · 22 Jan · Shift 1 Numerical

Let the function, $f(x) = \begin{cases} -3ax^2 - 2, & x < 1 \\ a^2 + bx, & x \geq 1 \end{cases}$ be differentiable for all $x \in \mathbf{R}$, where $a > 1$, $b \in \mathbf{R}$. If the area of the region enclosed by $y = f(x)$ and the line $y = -20$ is $\alpha + \beta\sqrt{3}$, $\alpha, \beta \in Z$, then the value of $\alpha + \beta$ is _____

Numerical value type: the answer is a number.

Answer: 34. · Key from source paper

Q38 JEE Main 2025 · 22 Jan · Shift 2 MCQ

The area of the region enclosed by the curves $y = x^2 - 4x + 4$ and $y^2 = 16 - 8x$ is :

(A) $\frac{8}{3}$
(B) $\frac{4}{3}$
(C) 8
(D) 5

Answer: (A) $\frac{8}{3}$ · Key from source paper

Q39 JEE Main 2024 · 9 Apr · Shift 1 MCQ

The parabola $y^2 = 4x$ divides the area of the circle $x^2 + y^2 = 5$ in two parts. The area of the smaller part is equal to:

(A) $\frac{1}{3} + 5\sin^{-1}\left(\frac{2}{\sqrt{5}}\right)$
(B) $\frac{1}{3} + \sqrt{5}\sin^{-1}\left(\frac{2}{\sqrt{5}}\right)$
(C) $\frac{2}{3} + 5\sin^{-1}\left(\frac{2}{\sqrt{5}}\right)$
(D) $\frac{2}{3} + \sqrt{5}\sin^{-1}\left(\frac{2}{\sqrt{5}}\right)$

Answer: (C) $\frac{2}{3} + 5\sin^{-1}\left(\frac{2}{\sqrt{5}}\right)$ · Key from source paper

Q40 JEE Main 2024 · 9 Apr · Shift 2 MCQ

The area (in square units) of the region enclosed by the ellipse $x^2 + 3y^2 = 18$ in the first quadrant below the line $y = x$ is

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

Answer: (C) $\sqrt{3}\pi$ · Key from source paper

Q41 JEE Main 2024 · 8 Apr · Shift 1 Numerical

Let the area of the region enclosed by the curve $y = \min\{\sin x, \cos x\}$ and the x axis between $x = -\pi$ to $x = \pi$ be A. Then A^2 is equal to _____

Numerical value type: the answer is a number.

Answer: 16. · Key from source paper

Q42 JEE Main 2024 · 8 Apr · Shift 2 MCQ

The area of the region in the first quadrant inside the circle $x^2 + y^2 = 8$ and outside the parabola $y^2 = 2x$ is equal to :

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

Answer: (D) $\pi - \frac{2}{3}$ · Key from source paper

Q43 JEE Main 2024 · 6 Apr · Shift 1 MCQ

Let the area of the region enclosed by the curves $y = 3x$, $2y = 27 - 3x$ and $y = 3x - x\sqrt{x}$ be A. Then $10A$ is equal to

(A) 172
(B) 162
(C) 154
(D) 184

Answer: (B) 162 · Key from source paper

Q44 JEE Main 2024 · 6 Apr · Shift 2 MCQ

If the area of the region $\{(x, y) : \frac{a}{x^2} \leq y \leq \frac{1}{x}, 1 \leq x \leq 2, 0 < a < 1\}$ is $(\log_e 2) - \frac{1}{7}$ then the value of $7a - 3$ is equal to:

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

Answer: (C) -1 · Key from source paper

Q45 JEE Main 2024 · 5 Apr · Shift 1 Numerical

The area of the region enclosed by the parabolas $y = x^2 - 5x$ and $y = 7x - x^2$ is

Numerical value type: the answer is a number.

Answer: 72. · Key from source paper

Q46 JEE Main 2024 · 5 Apr · Shift 2 MCQ

The area enclosed between the curves $y = x|x|$ and $y = x - |x|$ is :

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

Answer: (A) $\frac{4}{3}$ · Key from source paper

Q47 JEE Main 2024 · 4 Apr · Shift 1 MCQ

One of the points of intersection of the curves $y = 1 + 3x - 2x^2$ and $y = \frac{1}{x}$ is $\left(\frac{1}{2}, 2\right)$. Let the area of the region enclosed by these curves be $\frac{1}{24}(l\sqrt{5} + \mathrm{m}) - \mathrm{n}\log_e(1 + \sqrt{5})$, where $l,\ \mathrm{m}, \mathrm{n} \in \mathbf{N}$. Then $l + \mathrm{m} + \mathrm{n}$ is equal to

(A) 29
(B) 31
(C) 30
(D) 32

Answer: (C) 30 · Key from source paper

Q48 JEE Main 2024 · 4 Apr · Shift 2 MCQ

The area (in sq. units) of the region described by $\{(x, y) : y^2 \leq 2x, \text{ and } y \geq 4x - 1\}$ is

(A) $\frac{11}{32}$
(B) $\frac{8}{9}$
(C) $\frac{11}{12}$
(D) $\frac{9}{32}$

Answer: (D) $\frac{9}{32}$ · Key from source paper

Q49 JEE Main 2024 · 1 Feb · Shift 1 MCQ

The area enclosed by the curves $xy + 4y = 16$ and $x + y = 6$ is equal to:

(A) $28 - 30\log_e 2$
(B) $30 - 28\log_e 2$
(C) $30 - 32\log_e 2$
(D) $32 - 30\log_e 2$

Answer: (C) $30 - 32\log_e 2$ · Key from source paper

Q50 JEE Main 2024 · 1 Feb · Shift 2 Numerical

Three points $O0, 0$, Pa, a^2, $Q-b, b^2$, $a > 0$, $b > 0$, are on the parabola $y = x^2$. Let S_1 be the area of the region bounded by the line PQ and the parabola, and S_2 be the area of the triangle OPQ. If the minimum value of $\frac{S_1}{S_2}$ is $\frac{m}{n}$, $\gcd m, n = 1$, then $m + n$ is equal to:

Numerical value type: the answer is a number.

Answer: 7. · Key from source paper

Q51 JEE Main 2024 · 1 Feb · Shift 2 Numerical

The sum of squares of all possible values of k, for which area of the region bounded by the parabolas $2y^2 = kx$ and $ky^2 = 2y - x$ is maximum, is equal to:

Numerical value type: the answer is a number.

Answer: 8. · Key from source paper

Q52 JEE Main 2024 · 31 Jan · Shift 1 MCQ

The area of the region $x,\ y : y^2 \leq 4x,\ x < 4,\ \frac{xyx-1x-2}{x-3x-4} > 0,\ x \neq 3$ is

(A) $\frac{16}{3}$
(B) $\frac{64}{3}$
(C) $\frac{8}{3}$
(D) $\frac{32}{3}$

Answer: (D) $\frac{32}{3}$ · Key from source paper

Q53 JEE Main 2024 · 31 Jan · Shift 2 MCQ

The area of the region enclosed by the parabola $y = 4x - x^2$ and $3y = x - 4^2$ is equal to

(A) $\frac{32}{9}$
(B) 4
(C) 6
(D) $\frac{14}{3}$

Answer: (C) 6 · Key from source paper

Q54 JEE Main 2024 · 30 Jan · Shift 1 MCQ

The area (in square units) of the region bounded by the parabola $y^2 = 4(x - 2)$ and the line $y = 2x - 8$.

(A) 8
(B) 9
(C) 6
(D) 7

Answer: (B) 9 · Key from source paper

Q55 JEE Main 2024 · 30 Jan · Shift 2 Numerical

The area of the region enclosed by the parabola $(y-2)^2 = x-1$, the line $x-2y+4=0$ and the positive coordinate axes is _____.

Numerical value type: the answer is a number.

Answer: 5. · Key from source paper

Q56 JEE Main 2024 · 29 Jan · Shift 1 Numerical

The area (in sq. units) of the part of circle $x^2+y^2=169$ which is below the line $5x-y=13$ is $\frac{\pi\alpha}{2\beta} - \frac{65}{2} + \frac{\alpha}{\beta}\sin^{-1}\left(\frac{12}{13}\right)$ where α, β are coprime numbers. Then $\alpha+\beta$ is equal to

Numerical value type: the answer is a number.

Answer: 171. · Key from source paper

Q57 JEE Main 2024 · 29 Jan · Shift 2 Numerical

Let the area of the region $\{(x,y) : 0 \le x \le 3, 0 \le y \le \min\{x^2+2, 2x+2\}\}$ be A. Then $12A$ is equal to _____.

Numerical value type: the answer is a number.

Answer: 164. · Key from source paper

Q58 JEE Main 2024 · 27 Jan · Shift 1 Numerical

Let the area of the region $\{(x,y) : x-2y+4 \ge 0,\ x+2y^2 \ge 0,\ x+4y^2 \le 8,\ y \ge 0\}$ be $\frac{m}{n}$, where m and n are coprime numbers. Then m + n is equal to _____.

Numerical value type: the answer is a number.

Answer: 119. · Key from source paper

Q59 JEE Main 2024 · 27 Jan · Shift 2 Numerical

If the area of the region $(x,y) : 0 \le y \le \min 2x, 6x-x^2$ is A, then 12 A is equal to _____.

Numerical value type: the answer is a number.

Answer: 304. · Key from source paper

Q60 JEE Main 2023 · 15 Apr · Shift 1 Numerical

If the area bounded by the curve $2y^2 = 3x$, lines $x+y=3$, $y=0$ and outside the circle $(x-3)^2 + y^2 = 2$ is A, then $4(\pi+4A)$ is equal to _____.

Numerical value type: the answer is a number.

Answer: 42. · Key from source paper

Q61 JEE Main 2023 · 13 Apr · Shift 1 MCQ

The area of the region enclosed by the curve $f(x) = \max\{\sin x, \cos x\}$, $-\pi \le x \le \pi$ and the x-axis is

(A) $2\sqrt{2}\left(\sqrt{2}+1\right)$
(B) 4
(C) $4\left(\sqrt{2}\right)$
(D) $2\left(\sqrt{2}+1\right)$

Answer: (B) 4 · Key from source paper

Q62 JEE Main 2023 · 13 Apr · Shift 2 MCQ

The area of the region $x, y : x^2 \le y \le x^2 - 4, y \ge 1$ is

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

Answer: (A) $\frac{4}{3}\left(4\sqrt{2}-1\right)$ · Key from source paper

Q63 JEE Main 2023 · 12 Apr · Shift 1 MCQ

The area of the region enclosed by the curve $y = x^3$ and its tangent at the point $(-1,\ -1)$ is

(A) $\frac{19}{4}$
(B) $\frac{23}{4}$
(C) $\frac{31}{4}$
(D) $\frac{27}{4}$

Answer: (D) $\frac{27}{4}$ · Key from source paper

Q64 JEE Main 2023 · 11 Apr · Shift 1 MCQ

Area of the region $x, y : x^2 + y - 2^2 \le 4, x^2 \ge 2y$ is

(A) $\pi + \frac{8}{3}$
(B) $2\pi + \frac{16}{3}$
(C) $\pi - \frac{8}{3}$
(D) $2\pi - \frac{16}{3}$

Answer: (D) $2\pi - \frac{16}{3}$ · Key from source paper

Q65 JEE Main 2023 · 11 Apr · Shift 2 Numerical

If A is the area in the first quadrant enclosed by the curve $C : 2x^2 - y + 1 = 0$, the tangent to C at the point $(1,\ 3)$ and the line $x + y = 1$, then the value of $60A$ is _____

Numerical value type: the answer is a number.

Answer: 16. · Key from source paper

Q66 JEE Main 2023 · 10 Apr · Shift 1 Numerical

Let $y = px$ be the parabola passing through the points $-1, 0$, $0, 1$ and $1, 0$. If the area of the region $x, y : x + 1^2 + y - 1^2 \leq 1,\ y \leq px$ is A, then $12\pi - 4A$ is equal to _____ .

Numerical value type: the answer is a number.

Answer: 16. · Key from source paper

Q67 JEE Main 2023 · 10 Apr · Shift 2 Numerical

If the area of the region $x, y : x^2 - 2 \leq y \leq x$ is A, then $6A + 16\sqrt{2}$ is equal to _____

Numerical value type: the answer is a number.

Answer: 27. · Key from source paper

Q68 JEE Main 2023 · 8 Apr · Shift 1 MCQ

The area of the region $\{(x, y) : x^2 \leq y \leq 8 - x^2, y \leq 7\}$ is

(A) 27
(B) 18
(C) 20
(D) 21

Answer: (C) 20 · Key from source paper

Q69 JEE Main 2023 · 8 Apr · Shift 2 Numerical

Let the area enclosed by the lines $x + y = 2$, $y = 0$, $x = 0$ and the curve $f(x) = \min\left\{x^2 + \frac{3}{4}, 1 + [x]\right\}$ where $[x]$ denotes the greatest integer $\leq x$, be A. Then the value of $12A$ is

Numerical value type: the answer is a number.

Answer: 17. · Key from source paper

Q70 JEE Main 2023 · 6 Apr · Shift 1 Numerical

If the area of the region $S = \{(x, y) : 2y - y^2 \leq x^2 \leq 2y,\ x \geq y\}$ is equal to $\frac{n+2}{n+1} - \frac{\pi}{n-1}$, then the natural number n is equal to _____

Numerical value type: the answer is a number.

Answer: 5. · Key from source paper

Q71 JEE Main 2023 · 6 Apr · Shift 2 MCQ

The area bounded by the curves $y = |x - 1| + |x - 2|$ and $y = 3$ is equal to

(A) 4
(B) 6
(C) 3
(D) 5

Answer: (A) 4 · Key from source paper

Q72 JEE Main 2023 · 1 Feb · Shift 1 Numerical

Let A be the area bounded by the curve $y = xx - 3$, the x-axis and the ordinates x = - 1 and x = 2. Then 12 A is equal to _____.

Numerical value type: the answer is a number.

Answer: 62. · Key from source paper

Q73 JEE Main 2023 · 1 Feb · Shift 2 MCQ

The area of the region given by $\{(x, y) : xy \leq 8, 1 \leq y \leq x^2\}$ is :

(A) $8\ \log_e 2 - \frac{13}{3}$
(B) $16\ \log_e 2 - \frac{14}{3}$
(C) $8\ \log_e 2 + \frac{7}{6}$
(D) $16\ \log_e 2 + \frac{7}{3}$

Answer: (B) $16\ \log_e 2 - \frac{14}{3}$ · Key from source paper

---

Q74 JEE Main 2023 · 31 Jan · Shift 1 Numerical

Let for $x \in R$, $fx = \frac{x + x}{2}$ and $gx = \begin{cases} x, & x < 0 \\ x^2, & x \geq 0 \end{cases}$. Then area bounded by the curve $y = fogx$ and the lines $y = 0, 2y - x = 15$ is equal to _____.

Numerical value type: the answer is a number.

Answer: 72. · Key from source paper

Q75 JEE Main 2023 · 31 Jan · Shift 2 Numerical

Let the area of the region $\{(x, y) : |2x - 1| \leq y \leq |x^2 - x|, 0 \leq x \leq 1\}$ be A. Then $(6A + 11)^2$ is equal to _____ .

Numerical value type: the answer is a number.

Answer: 125. · Key from source paper

Q76 JEE Main 2023 · 30 Jan · Shift 1 Numerical

Let α be the area of the larger region bounded by the curve $y^2 = 8x$ and the lines $y = x$ and $x = 2$, which lies in the first quadrant. Then the value of 3α is equal to

Numerical value type: the answer is a number.

Answer: 22. · Key from source paper

Q77 JEE Main 2023 · 30 Jan · Shift 2 Numerical

Let A be the area of the region $\{(x, y) : y \geq x^2, y \geq (1-x)^2, y \leq 2x(1-x)\}$. Then $540A$ is equal to

Numerical value type: the answer is a number.

Answer: 25. · Key from source paper

Q78 JEE Main 2023 · 29 Jan · Shift 1 MCQ

Let $A = \left\{(x, y) \in \mathbb{R}^2 : y \geq 0, 2x \leq y \leq \sqrt{4-(x-1)^2}\right\}$ and $B = \left\{(x, y) \in \mathbb{R} \times \mathbb{R} : 0 \leq y \leq \min\left\{2x, \sqrt{4-(x-1)^2}\right\}\right\}$. Then the ratio of the area of A to the area of B is

(A) $\frac{\pi-1}{\pi+1}$
(B) $\frac{\pi}{\pi-1}$
(C) $\frac{\pi}{\pi+1}$
(D) $\frac{\pi+1}{\pi-1}$

Answer: (A) $\frac{\pi-1}{\pi+1}$ · Key from source paper

Q79 JEE Main 2023 · 29 Jan · Shift 1 MCQ

Let Δ be the area of the region $\{(x, y) \in \mathbb{R}^2 : x^2 + y^2 \leq 21, y^2 \leq 4x, x \geq 1\}$. Then $\frac{1}{2}\left(\Delta - 21\sin^{-1}\frac{2}{\sqrt{7}}\right)$ is equal to

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

Answer: (D) $\sqrt{3} - \frac{4}{3}$ · Key from source paper

Q80 JEE Main 2023 · 29 Jan · Shift 2 MCQ

The area of the region $A = \left\{(x, y) : |\cos x - \sin x| \leq y \leq \sin x, 0 \leq x \leq \frac{\pi}{2}\right\}$

(A) $1-\frac{3}{\sqrt{2}}+\frac{4}{\sqrt{5}}$
(B) $\sqrt{5}+2\sqrt{2}-4.5$
(C) $\frac{3}{\sqrt{5}}-\frac{3}{\sqrt{2}}+1$
(D) $\sqrt{5}-2\sqrt{2}+1$

Answer: (D) $\sqrt{5}-2\sqrt{2}+1$ · Key from source paper

Q81 JEE Main 2023 · 25 Jan · Shift 1 · Numerical

If the area enclosed by the parabolas $P_1 : 2y = 5x^2$ and $P_2 : x^2 - y + 6 = 0$ is equal to the area enclosed by P_1 and $y = \alpha x$, $\alpha > 0$, then α^3 is equal to _____ .

Numerical value type: the answer is a number.

Answer: 600. · Key from source paper

Q82 JEE Main 2023 · 25 Jan · Shift 2 · MCQ

Let T and C respectively, be the transverse and conjugate axes of the hyperbola $16x^2 - y^2 + 64x + 4y + 44 = 0$. Then the area of the region above the parabola $x^2 = y + 4$, below the transverse axis T and on the right of the conjugate axis C is:

(A) $4\sqrt{6}+\frac{44}{3}$
(B) $4\sqrt{6}+\frac{28}{3}$
(C) $4\sqrt{6}-\frac{44}{3}$
(D) $4\sqrt{6}-\frac{28}{3}$

Answer: (B) $4\sqrt{6}+\frac{28}{3}$ · Key from source paper

Q83 JEE Main 2023 · 24 Jan · Shift 1 · MCQ

The area enclosed between the curves $y^2 + 4x = 4$ and $y - 2x = 2$ is

(A) $\frac{25}{3}$
(B) $\frac{22}{3}$
(C) 9
(D) $\frac{23}{3}$

Answer: (C) 9 · Key from source paper

Q84 JEE Main 2023 · 24 Jan · Shift 2 · Numerical

If the area of the region bounded by the curves $y^2 - 2y = -x$ and $x + y = 0$ is A, then $8A =$

Numerical value type: the answer is a number.

Answer: 36. · Key from source paper

Q85 JEE Main 2022 · 29 Jul · Shift 1 MCQ

The area of the region $\left\{(x, y) : |x-1| \leq y \leq \sqrt{5-x^2}\right\}$ is equal to

(A) $\frac{5}{2}\sin^{-1}\left(\frac{3}{5}\right) - \frac{1}{2}$
(B) $\frac{5\pi}{4} - \frac{3}{2}$
(C) $\frac{3\pi}{4} + \frac{3}{2}$
(D) $\frac{5\pi}{4} - \frac{1}{2}$

Answer: (D) $\frac{5\pi}{4} - \frac{1}{2}$ · Key from source paper

Q86 JEE Main 2022 · 28 Jul · Shift 2 MCQ

The area enclosed by the curves $y = \log_e(x + e^2)$, $x = \log_e\left(\frac{2}{y}\right)$ and $x = \log_e 2$, above the line $y = 1$ is

(A) $2 + e - \log_e 2$
(B) $1 + e - \log_e 2$
(C) $e - \log_e 2$
(D) $1 + \log_e 2$

Answer: (B) $1 + e - \log_e 2$ · Key from source paper

Q87 JEE Main 2022 · 27 Jul · Shift 1 MCQ

The area of the smaller region enclosed by the curves $y^2 = 8x + 4$ and $x^2 + y^2 + 4\sqrt{3}x - 4 = 0$ is equal to

(A) $\frac{1}{3}\left(2 - 12\sqrt{3} + 8\pi\right)$
(B) $\frac{1}{3}\left(2 - 12\sqrt{3} + 6\pi\right)$
(C) $\frac{1}{3}\left(4 - 12\sqrt{3} + 8\pi\right)$
(D) $\frac{1}{3}\left(4 - 12\sqrt{3} + 6\pi\right)$

Answer: (C) $\frac{1}{3}\left(4 - 12\sqrt{3} + 8\pi\right)$ · Key from source paper

Q88 JEE Main 2022 · 27 Jul · Shift 2 MCQ

The area of the region enclosed by $y \leq 4x^2$, $x^2 \leq 9y$ and $y \leq 4$, is equal to

(A) $\frac{40}{3}$
(B) $\frac{56}{3}$
(C) $\frac{112}{3}$
(D) $\frac{80}{3}$

Answer: (D) $\frac{80}{3}$ · Key from source paper

Q89 JEE Main 2022 · 26 Jul · Shift 1 MCQ

The odd natural number a, such that the area of the region bounded by $y = 1, y = 3, x = 0, x = y^a$ is $\frac{364}{3}$, equal to:

(A) 3
(B) 5
(C) 7
(D) 9

Answer: (B) 5 · Key from source paper

Q90 JEE Main 2022 · 26 Jul · Shift 2 MCQ

The area bounded by the curves $y = x^2 - 1$ and $y = 1$ is

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

Answer: (D) $\frac{8}{3}\sqrt{2} - 1$ · Key from source paper

Q91 JEE Main 2022 · 25 Jul · Shift 1 MCQ

The area of the region given by $A = x, y : x^2 \leq y \leq \min x + 2, 4 - 3x$ is

(A) $\frac{31}{8}$
(B) $\frac{17}{6}$
(C) $\frac{19}{6}$
(D) $\frac{27}{8}$

Answer: (B) $\frac{17}{6}$ · Key from source paper

Q92 JEE Main 2022 · 29 Jun · Shift 1 MCQ

The area enclosed by $y^2 = 8x$ and $y = \sqrt{2}x$ that lies outside the triangle formed by $y = \sqrt{2}x,\ x = 1,\ y = 2\sqrt{2}$, is equal to

(A) $\frac{16\sqrt{2}}{6}$
(B) $\frac{11\sqrt{2}}{6}$
(C) $\frac{13\sqrt{2}}{6}$
(D) $\frac{5\sqrt{2}}{6}$

Answer: (C) $\frac{13\sqrt{2}}{6}$ · Key from source paper

Q93 JEE Main 2022 · 29 Jun · Shift 2 MCQ

If $\int_0^2 \left(\sqrt{2x}-\sqrt{2x-x^2}\right)dx = \int_0^1 \left(1-\sqrt{1-y^2}-\frac{y^2}{2}\right)dy + \int_1^2 \left(2-\frac{y^2}{2}\right)dy + I$, then I equal to

(A) $\int_0^1 \left(1+\sqrt{1-y^2}\right)dy$

(B) $\int_0^1 \left(\frac{y^2}{2}-\sqrt{1-y^2}+1\right)dy$

(C) $\int_0^1 \left(1-\sqrt{1-y^2}\right)dy$

(D) $\int_0^1 \left(\frac{y^2}{2}+\sqrt{1-y^2}+1\right)dy$

Answer: (C) $\int_0^1 \left(1-\sqrt{1-y^2}\right)dy$ · Key from source paper

Q94 JEE Main 2022 · 29 Jun · Shift 2 Numerical

For real numbers $a,\ b(a>b>0)$, let

Area $\left\{(x,\ y) : x^2+y^2 \le a^2 \text{ and } \frac{x^2}{a^2}+\frac{y^2}{b^2} \ge 1\right\} = 30\pi$

and

Area $\left\{(x,\ y) : x^2+y^2 \ge b^2 \text{ and } \frac{x^2}{a^2}+\frac{y^2}{b^2} \le 1\right\} = 18\pi$

Then the value of $(a-b)^2$ is equal to _____.

Numerical value type: the answer is a number.

Answer: 12. · Key from source paper

Q95 JEE Main 2022 · 28 Jun · Shift 1 MCQ

The area of the region $S = \left\{(x,y) : y^2 \le 8x,\ y \ge \sqrt{2}x,\ x \ge 1\right\}$ is

(A) $\frac{5\sqrt{2}}{6}$

(B) $\frac{19\sqrt{2}}{6}$

(C) $\frac{13\sqrt{2}}{6}$

(D) $\frac{11\sqrt{2}}{6}$

Answer: (D) $\frac{11\sqrt{2}}{6}$ · Key from source paper

Q96 JEE Main 2022 · 28 Jun · Shift 2 MCQ

The area of the bounded region enclosed by the curve $y = 3-\left|x-\frac{1}{2}\right|-|x+1|$ and the x-axis is

(A) $\frac{9}{4}$
(B) $\frac{45}{16}$
(C) $\frac{27}{8}$
(D) $\frac{63}{16}$

Answer: (C) $\frac{27}{8}$ · Key from source paper

Q97 JEE Main 2022 · 27 Jun · Shift 1 · Numerical

Let $A_1 = \{(x, y) : |x| \leq y^2, |x| + 2y \leq 8\}$ and $A_2 = \{(x, y) : |x| + |y| \leq k\}$. If $27\,(\text{Area } A_1) = 5(\text{Area } A_2)$, then k is equal to _____ .

Numerical value type: the answer is a number.

Answer: 6. · Key from source paper

Q98 JEE Main 2022 · 27 Jun · Shift 2 · Numerical

If the area of the region $\left\{(x, y) : x^{\frac{2}{3}} + y^{\frac{2}{3}} \leq 1, x + y \geq 0, y \geq 0\right\}$ is A, then $\frac{256A}{\pi}$ is

Numerical value type: the answer is a number.

Answer: 36. · Key from source paper

Q99 JEE Main 2022 · 26 Jun · Shift 1 · MCQ

The area bounded by the curve $y = |x^2 - 9|$ and the line $y = 3$ is

(A) $8\sqrt{6} - 16\sqrt{12} - 72$
(B) $8\sqrt{6} + 8\sqrt{12} - 72$
(C) $16\sqrt{6} + 16\sqrt{12} - 72$
(D) $16\sqrt{6} - 16\sqrt{12} - 64$

Answer: (C) $16\sqrt{6} + 16\sqrt{12} - 72$ · Key from source paper

---

Q100 JEE Main 2022 · 26 Jun · Shift 2 · MCQ

The area of the region bounded by $y^2 = 8x$ and $y^2 = 16(3 - x)$ is equal to

(A) $\frac{32}{3}$
(B) $\frac{40}{3}$
(C) 16
(D) 9

Answer: (C) 16 · Key from source paper

Q101 JEE Main 2022 · 25 Jun · Shift 2 · MCQ

The area of the region enclosed between the parabolas $y^2 = 2x - 1$ and $y^2 = 4x - 3$ is.

(A) $\frac{1}{3}$
(B) $\frac{1}{6}$
(C) $\frac{2}{3}$
(D) $\frac{3}{4}$

Answer: (A) $\frac{1}{3}$ · Key from source paper

Q102 JEE Main 2022 · 24 Jun · Shift 1 Numerical

Let S be the region bounded by the curves $y = x^3$ and $y^2 = x$. The curve $y = 2|x|$ divides S into two regions of areas R_1 and R_2. If $\max|R_1, R_2| = R_2$, then $\frac{R_2}{R_1}$ is equal to _____

Numerical value type: the answer is a number.

Answer: 19. · Key from source paper

Q103 JEE Main 2022 · 24 Jun · Shift 2 Numerical

The area (in sq. units) of the region enclosed between the parabola $y^2 = 2x$ and the line $x + y = 4$ is _____ .

Numerical value type: the answer is a number.

Answer: 18. · Key from source paper

Q104 JEE Main 2021 · 1 Sep · Shift 2 MCQ

The area, enclosed by the curves $y = \sin x + \cos x$ and $y = |\cos x - \sin x|$ and the lines $x = 0$, $x = \frac{\pi}{2}$, is :

(A) $2\sqrt{2}\left(\sqrt{2}+1\right)$
(B) $2\sqrt{2}\left(\sqrt{2}-1\right)$
(C) $4\left(\sqrt{2}-1\right)$
(D) $2\left(\sqrt{2}+1\right)$

Answer: (B) $2\sqrt{2}\left(\sqrt{2}-1\right)$ · Key from source paper

---

Q105 JEE Main 2021 · 31 Aug · Shift 2 Numerical

If the line $y = mx$ bisects the area enclosed by the lines $x = 0$, $y = 0$, $x = \frac{3}{2}$ and the curve $y = 1 + 4x - x^2$, then $12m$ is equal to _____.

Numerical value type: the answer is a number.

Answer: 26. · Key from source paper

Q106 JEE Main 2021 · 27 Aug · Shift 2 MCQ

The area of the region bounded by the parabola $(y-2)^2 = (x-1)$, the tangent to it at the point whose ordinate is 3 and the x-axis, is:

EdLoop JEE

(A) 4
(B) 6
(C) 9
(D) 10

Answer: (C) 9 · Key from source paper

Q107 JEE Main 2021 · 26 Aug · Shift 1 · Numerical

The area of the region $S = \{(x, y) : 3x^2 \leq 4y \leq 6x + 24\}$ is _____.

Numerical value type: the answer is a number.

Answer: 27. · Key from source paper

Q108 JEE Main 2021 · 26 Aug · Shift 2 · Numerical

Let a and b respectively be the points of local maximum and local minimum of the function $f(x) = 2x^3 - 3x^2 - 12x$. If A is the total area of the region bounded by $y = f(x)$, the x-axis and the lines $x = a$ and $x = b$, then $4A$ is equal to _____.

Numerical value type: the answer is a number.

Answer: 114. · Key from source paper

Q109 JEE Main 2021 · 27 Jul · Shift 1 · MCQ

If the area of the bounded region $R = \{(x, y) : \max\{0, \log_e x\} \leq y \leq 2^x, \frac{1}{2} \leq x \leq 2\}$ is, $\alpha(\log_e 2)^{-1} + \beta(\log_e 2) + \gamma$ then the value of $(\alpha + \beta - 2\gamma)^2$ is equal to:

(A) 8
(B) 2
(C) 4
(D) 1

Answer: (B) 2 · Key from source paper

Q110 JEE Main 2021 · 27 Jul · Shift 2 · MCQ

The area of the region bounded by $y - x = 2$ and $x^2 = y$ is equal to :-

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

Answer: (C) $\frac{9}{2}$ · Key from source paper

EdLoop JEE

Q111 JEE Main 2021 · 25 Jul · Shift 1 MCQ

The area (in sq. units) of the region, given by the set $x, y \in R \times R \mid x \geq 0, 2x^2 \leq y \leq 4 - 2x$ is :

(A) $\frac{8}{3}$
(B) $\frac{17}{3}$
(C) $\frac{13}{3}$
(D) $\frac{7}{3}$

Answer: (D) $\frac{7}{3}$ · Key from source paper

Q112 JEE Main 2021 · 22 Jul · Shift 1 Numerical

The area (in sq. units) of the region bounded by the curves $x^2 + 2y - 1 = 0$, $y^2 + 4x - 4 = 0$ and $y^2 - 4x - 4 = 0$ in the upper half plane is _____.

Numerical value type: the answer is a number.

Answer: 2. · Key from source paper

Q113 JEE Main 2021 · 20 Jul · Shift 1 Numerical

Let T be the tangent to the ellipse $E : x^2 + 4y^2 = 5$ at the point $P(1, 1)$. If the area of the region bounded by the tangent T, ellipse E, lines $x = 1$ and $x = \sqrt{5}$ is $\alpha\sqrt{5} + \beta + \gamma \cos^{-1}\left(\frac{1}{\sqrt{5}}\right)$, then $|\alpha + \beta + \gamma|$ is equal to _____.

Numerical value type: the answer is a number.

Answer: 1.25. · Key from source paper

Q114 JEE Main 2021 · 18 Mar · Shift 2 MCQ

The area (in sq. unit) bounded by the curve $4y^2 = x^2(4 - x)(x - 2)$ is equal to

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

Answer: (C) $\frac{3\pi}{2}$ · Key from source paper

Q115 JEE Main 2021 · 17 Mar · Shift 2 Numerical

Let $f : [-3, 1] \to R$ be given as $f(x) = \begin{cases} \min\{(x+6), x^2\}, & -3 \leq x \leq 0 \\ \max\{\sqrt{x}, x^2\}, & 0 \leq x \leq 1 \end{cases}$. If the area bounded by $y = f(x)$ and x-axis is A sq units, then the value of $6A$ is equal to

Numerical value type: the answer is a number.

Answer: 41. · Key from source paper

Q116 JEE Main 2021 · 16 Mar · Shift 1 Numerical

Let the curve $y = y(x)$ be the solution of the differential equation, $\frac{dy}{dx} = 2(x+1)$. If the numerical value of area bounded by the curve $y = y(x)$ and x-axis is $\frac{4\sqrt{8}}{3}$, then the value of $y(1)$ is equal to _____.

Numerical value type: the answer is a number.

Answer: 2. · Key from source paper

Q117 JEE Main 2021 · 26 Feb · Shift 1 Numerical

The area bounded by the lines $y = ||x-1|-2|$ and $y = 2$ is _____.

Numerical value type: the answer is a number.

Answer: 8. · Key from source paper

Q118 JEE Main 2021 · 26 Feb · Shift 2 MCQ

Let A_1 be the area of the region bounded by the curves $y = \sin x$, $y = \cos x$ and y-axis in the first quadrant. Also, let A_2 be the area of the region bounded by the curves $y = \sin x$, $y = \cos x$, x-axis and $x = \frac{\pi}{2}$ in the first quadrant. Then,

(A) $2A_1 = A_2$ and $A_1 + A_2 = 1 + \sqrt{2}$

(B) $A_1 : A_2 = 1 : \sqrt{2}$ and $A_1 + A_2 = 1$

(C) $A_1 : A_2 = 1 : 2$ and $A_1 + A_2 = 1$

(D) $A_1 = A_2$ and $A_1 + A_2 = \sqrt{2}$

Answer: (B) $A_1 : A_2 = 1 : \sqrt{2}$ and $A_1 + A_2 = 1$ · Key from source paper

Q119 JEE Main 2021 · 25 Feb · Shift 1 Numerical

The graphs of sine and cosine functions, intersect each other at a number of points and between two consecutive points of intersection, the two graphs enclose the same area A. Then A^4 is equal to

Numerical value type: the answer is a number.

Answer: 64. · Key from source paper

Q120 JEE Main 2021 · 24 Feb · Shift 1 MCQ

The area (in sq. units) of the part of the circle $x^2 + y^2 = 36$, which is outside the parabola $y^2 = 9x$, is equal to

(A) $12\pi + 3\sqrt{3}$
(B) $24\pi + 3\sqrt{3}$
(C) $24\pi - 3\sqrt{3}$
(D) $12\pi - 3\sqrt{3}$

Answer: (C) $24\pi - 3\sqrt{3}$ · Key from source paper

Q121 JEE Main 2021 · 24 Feb · Shift 2 MCQ

The area of the region: $R = \{(x, y) : 5x^2 \leq y \leq 2x^2 + 9\}$ is

(A) $9\sqrt{3}$ square units
(B) $12\sqrt{3}$ square units
(C) $11\sqrt{3}$ square units
(D) $6\sqrt{3}$ square units

Answer: (B) $12\sqrt{3}$ **square units** · Key from source paper

---

Q122 JEE Main 2020 · 6 Sep · Shift 1 MCQ

The area (in sq. units) of the region $A = \{(x, y) : |x| + |y| \leq 1, 2y^2 \geq |x|\}$

(A) $\frac{1}{3}$
(B) $\frac{7}{6}$
(C) $\frac{1}{6}$
(D) $\frac{5}{6}$

Answer: (D) $\frac{5}{6}$ · Key from source paper

Q123 JEE Main 2020 · 6 Sep · Shift 2 MCQ

The area (in sq. units) of the region enclosed by the curves $y = x^2 - 1$ and $y = 1 - x^2$ is equal to:

(A) $\frac{4}{3}$
(B) $\frac{8}{3}$
(C) $\frac{7}{2}$
(D) $\frac{16}{3}$

Answer: (B) $\frac{8}{3}$ · Key from source paper

Q124 JEE Main 2020 · 5 Sep · Shift 2 MCQ

The area (in sq. units) of the region $A = \{(x, y) : (x - 1)[x] \leq y \leq 2\sqrt{x}, 0 \leq x \leq 2\}$, where $[t]$ denotes the greatest integer function, is :

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

Answer: (A) $\frac{8}{3}\sqrt{2}-\frac{1}{2}$ · Key from source paper

---

Q125 JEE Main 2020 · 3 Sep · Shift 1 MCQ

The area (in sq. units) of the region $\left\{(x,\ y) : 0 \le y \le x^2+1,\ 0 \le y \le x+1,\ \frac{1}{2} \le x \le 2\right\}$ is

(A) $\frac{23}{16}$
(B) $\frac{79}{24}$
(C) $\frac{79}{16}$
(D) $\frac{23}{6}$

Answer: (B) $\frac{79}{24}$ · Key from source paper

Q126 JEE Main 2020 · 2 Sep · Shift 1 MCQ

Area (in sq. units) of the region outside $\frac{|x|}{2}+\frac{|y|}{3}=1$ and inside the ellipse $\frac{x^2}{4}+\frac{y^2}{9}=1$ is

(A) $6(\pi-2)$
(B) $3(\pi-2)$
(C) $3(4-\pi)$
(D) $6(4-\pi)$

Answer: (A) $6(\pi-2)$ · Key from source paper

Q127 JEE Main 2020 · 2 Sep · Shift 2 MCQ

Consider a region $R=\{(x,y)\in R^2 : x^2 \le y \le 2x\}$. If a line $y=\alpha$ divides the area of region R into two equal parts, then which of the following is true ?

(A) $\alpha^3-6\alpha^2+16=0$
(B) $3\alpha^2-8\alpha^{3/2}+8=0$
(C) $3\alpha^2-8\alpha+8=0$
(D) $\alpha^3-6\alpha^{3/2}-16=0$

Answer: (B) $3\alpha^2-8\alpha^{3/2}+8=0$ · Key from source paper

---

Q128 JEE Main 2020 · 9 Jan · Shift 2 MCQ

Given: $f(x)=\begin{cases} x, 0 \le x < \frac{1}{2} \\ \frac{1}{2}, x=\frac{1}{2} \\ 1-x, \frac{1}{2} < x \le 1 \end{cases}$

and $g(x)=\left(x-\frac{1}{2}\right)^2, x\in R$. Then, the area (in sq. units) of the region bounded by the curves, $y=f(x)$ and $y=g(x)$ between the lines $2x=1$ and $2x=\sqrt{3}$, is:

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

Answer: (B) $\frac{\sqrt{3}}{4}-\frac{1}{3}$ · Key from source paper

Q129 JEE Main 2020 · 8 Jan · Shift 1 MCQ

For $a>0$, let the curves $C_1: y^2=ax$ and $C_2: x^2=ay$ intersect at origin O and a point P. Let the line $x=b(0<b<a)$ intersect the chord OP and the x -axis at points Q and R, respectively. If the line $x=b$ bisects the area bounded by the curves, C_1 and C_2, and the area of $\Delta OQR=\frac{1}{2}$, then ' a ' satisfies the equation:

(A) $x^6-6x^3+4=0$
(B) $x^6-12x^3+4=0$
(C) $x^6+6x^3-4=0$
(D) $x^6-12x^3-4=0$

Answer: (B) $x^6-12x^3+4=0$ · Key from source paper

Q130 JEE Main 2020 · 8 Jan · Shift 2 MCQ

The area (in sq. units) of the region $\{(x,y)\in R^2: x^2\le y\le 3-2x\}$, is.

(A) $\frac{32}{3}$
(B) $\frac{34}{3}$
(C) $\frac{29}{3}$
(D) $\frac{31}{3}$

Answer: (A) $\frac{32}{3}$ · Key from source paper

Q131 JEE Main 2020 · 7 Jan · Shift 1 MCQ

The area of the region (in sq. units), enclosed by the circle $x^2+y^2=2$ which is not common to the region bounded by the parabola $y^2=x$ and the straight line $y=x$, is

(A) $\frac{1}{6}(24\pi-1)$
(B) $\frac{1}{3}(6\pi-1)$
(C) $\frac{1}{3}(12\pi-1)$
(D) $\frac{1}{6}(12\pi-1)$

Answer: (D) $\frac{1}{6}(12\pi-1)$ · Key from source paper

Q132 JEE Main 2020 · 7 Jan · Shift 2 MCQ

The area (in sq. units) of the region $\{(x,y)\in R^2|4x^2\le y\le 8x+12\}$ is

(A) $\frac{125}{3}$
(B) $\frac{128}{3}$
(C) $\frac{124}{3}$
(D) $\frac{127}{3}$

Answer: (B) $\frac{128}{3}$ · Key from source paper

Q133 JEE Main 2019 · 12 Apr · Shift 1 MCQ

If the area (in sq. units) of the region $x,\ \ y:\ \ y^2 \le 4x,\ \ x+y \le 1,\ \ x \ge 0,\ \ y \ge 0$ is $a\sqrt{2}+b$, then $a-b$ is equal to:

(A) 6
(B) $\frac{10}{3}$
(C) $-\frac{2}{3}$
(D) $\frac{8}{3}$

Answer: (A) 6 · Key from source paper

Q134 JEE Main 2019 · 12 Apr · Shift 2 MCQ

If the area (in sq. units) bounded by the parabola $y^2 = 4\lambda x$ and the line $y = \lambda x,\ \lambda > 0$, is $\frac{1}{9}$, then λ is equal to

(A) $4\sqrt{3}$
(B) $2\sqrt{6}$
(C) 48
(D) 24

Answer: (D) 24 · Key from source paper

Q135 JEE Main 2019 · 10 Apr · Shift 1 MCQ

The region represented by $|x-y| \le 2$ and $|x+y| \le 2$ is bounded by a

(A) rhombus of area $8\sqrt{2}$ sq. units.
(B) rhombus of side length 2 units.
(C) square of area 16 sq. units.
(D) square of side length $2\sqrt{2}$ units.

Answer: (D) square of side length $2\sqrt{2}$ units. · Key from source paper

---

Q136 JEE Main 2019 · 10 Apr · Shift 2 MCQ

The area (in sq. units) of the region bounded by the curves $y = 2^x$ and $y = x+1$, in the first quadrant is

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

Answer: (A) $\frac{3}{2} - \frac{1}{\log_e 2}$ · Key from source paper

---

Q137 JEE Main 2019 · 9 Apr · Shift 1 MCQ

The area (in sq. units) of the region $A = \{(x, y) : x^2 \leq y \leq x + 2\}$ is

(A) $\frac{13}{6}$
(B) $\frac{31}{6}$
(C) $\frac{9}{2}$
(D) $\frac{10}{3}$

Answer: (C) $\frac{9}{2}$ · Key from source paper

Q138 JEE Main 2019 · 9 Apr · Shift 2 MCQ

The area (in sq. units) of the region $A = \left\{(x, y) : \frac{y^2}{2} \leq x \leq y + 4\right\}$ is

(A) 30
(B) 18
(C) $\frac{53}{3}$
(D) 16

Answer: (B) 18 · Key from source paper

Q139 JEE Main 2019 · 8 Apr · Shift 1 MCQ

The area (in sq. units) of the region $A = x, y \in R \times R0 \leq x \leq 3,\ 0 \leq y \leq 4, y \leq x^2 + 3x$ is

(A) $\frac{26}{3}$
(B) 8
(C) $\frac{53}{6}$
(D) $\frac{59}{6}$

Answer: (D) $\frac{59}{6}$ · Key from source paper

Q140 JEE Main 2019 · 8 Apr · Shift 2 MCQ

Let $S\alpha = x, y : y^2 \leq x,\ 0 \leq x \leq \alpha$ and $A\alpha$ is area of the region $S\alpha$. If for a $\lambda, 0 < \lambda < 4$, $A\lambda : A4 = 2 : 5$, then λ equals:

(A) $4\left(\frac{2}{5}\right)^{\frac{1}{3}}$
(B) $2\left(\frac{4}{25}\right)^{\frac{1}{3}}$
(C) $4\left(\frac{4}{25}\right)^{\frac{1}{3}}$
(D) $2\left(\frac{2}{5}\right)^{\frac{1}{3}}$

Answer: (C) $4\left(\frac{4}{25}\right)^{\frac{1}{3}}$ · Key from source paper

Q141 JEE Main 2019 · 12 Jan · Shift 1 MCQ

The area (in sq. units) of the region bounded by the parabola, $y = x^2 + 2$ and the lines, $y = x + 1$, $x = 0$ and $x = 3$, is

(A) $\frac{17}{4}$
(B) $\frac{21}{2}$
(C) $\frac{15}{2}$
(D) $\frac{15}{4}$

Answer: (C) $\frac{15}{2}$ · Key from source paper

Q142 JEE Main 2019 · 11 Jan · Shift 1 MCQ

The area (in sq. units) of the region bounded by the curve $x^2 = 4y$ and the straight line $x = 4y - 2$ is :

(A) $\frac{5}{4}$
(B) $\frac{9}{8}$
(C) $\frac{7}{8}$
(D) $\frac{3}{4}$

Answer: (B) $\frac{9}{8}$ · Key from source paper

Q143 JEE Main 2019 · 11 Jan · Shift 2 MCQ

The area (in sq. units) in the first quadrant bounded by the parabola, $y = x^2 + 1$, the tangent to it at the point (2,5) and the coordinate axes is :

(A) $\frac{8}{3}$
(B) $\frac{37}{24}$
(C) $\frac{187}{24}$
(D) $\frac{14}{3}$

Answer: (B) $\frac{37}{24}$ · Key from source paper

Q144 JEE Main 2019 · 10 Jan · Shift 1 MCQ

If the area enclosed between the curves $y = kx^2$ and $x = ky^2$, $(k > 0)$, is 1 $sq.\ unit$. Then k is

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

Answer: (B) $\frac{1}{\sqrt{3}}$ · Key from source paper

Q145 JEE Main 2019 · 9 Jan · Shift 1 MCQ

The area (in sq. units) bounded by the parabola $y = x^2 - 1$, the tangent at the point $2, 3$ to it and the y-axis is

(A) $\frac{14}{3}$
(B) $\frac{8}{3}$
(C) $\frac{32}{3}$
(D) $\frac{56}{3}$

Answer: (B) $\frac{8}{3}$ · Key from source paper

Q146 JEE Main 2019 · 9 Jan · Shift 2 MCQ

The area of the region $A = \{(x,\ y) : 0 \leq y \leq x|x| + 1 \text{ and } -1 \leq x \leq 1\}$ in sq. units, is

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

Answer: (B) 2 · Key from source paper

Q147 JEE Main 2018 · 16 Apr · Online MCQ

If the area of the region bounded by the curves, $y = x^2$, $y = \frac{1}{x}$ and the lines $y = 0$ and $x = t(t > 1)$ is 1 sq. unit, then t is equal to

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

Answer: (A) $e^{\frac{2}{3}}$ · Key from source paper

Q148 JEE Main 2018 · 15 Apr · Shift 1 MCQ

The area (in sq. units) of the region $\{x \in R : x \geq 0, y \geq 0, y \geq x - 2 \text{ and } y \leq \sqrt{x}\}$, is

(A) $\frac{13}{3}$
(B) $\frac{10}{3}$
(C) $\frac{5}{3}$
(D) $\frac{8}{3}$

Answer: (B) $\frac{10}{3}$ · Key from source paper

Q149 JEE Main 2018 · 8 Apr · Offline MCQ

Let $g(x) = \cos x^2$, $f(x) = \sqrt{x}$, and $\alpha, \beta(\alpha < \beta)$ be the roots of the quadratic equation $18x^2 - 9\pi x + \pi^2 = 0$. Then the area (in sq. units) bounded by the curve $y = (gof)(x)$ and the lines $x = \alpha$, $x = \beta$ and $y = 0$, is

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

Answer: (B) $\frac{1}{2}\left(\sqrt{3} - 1\right)$ · Key from source paper

---

Q150 JEE Main 2017 · 8 Apr · Online MCQ

The area (in sq. units) of the smaller portion enclosed between the curves, $x^2 + y^2 = 4$ and $y^2 = 3x$, is:

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

Answer: (A) $\frac{1}{\sqrt{3}} + \frac{4\pi}{3}$ · Key from source paper

EdLoop JEE

Q151 JEE Main 2017 · 2 Apr · Offline · MCQ

The area (in sq. units) of the region $\{(x,\ y):\ x \geq 0,\ x+y \leq 3,\ x^2 \leq 4y \text{ and } y \leq 1+\sqrt{x}\}$ is

(A) $\frac{59}{12}$ sq. units
(B) $\frac{3}{2}$ sq. units
(C) $\frac{7}{3}$ sq. units
(D) $\frac{5}{2}$ sq. units

Answer: (D) $\frac{5}{2}$ sq. units · Key from source paper

Q152 JEE Main 2016 · 9 Apr · Online · MCQ

The area (in sq. units) of the region described by $A=\{(x,y)|\ y \geq x^2-5x+4,\ x+y \geq 1,\ y \leq 0\}$ is

(A) $\frac{19}{6}$
(B) $\frac{17}{6}$
(C) $\frac{7}{2}$
(D) $\frac{13}{6}$

Answer: (A) $\frac{19}{6}$ · Key from source paper

Q153 JEE Main 2016 · 3 Apr · Offline · MCQ

The area (in sq. units) of the region $\{(x,\ y): y^2 \geq 2x \text{ and } x^2+y^2 \leq 4x,\ x \geq 0,\ y \geq 0\}$ is

(A) $\pi - \frac{4\sqrt{2}}{3}$
(B) $\frac{\pi}{2} - \frac{2\sqrt{2}}{3}$
(C) $\pi - \frac{4}{3}$
(D) $\pi - \frac{8}{3}$

Answer: (D) $\pi - \frac{8}{3}$ · Key from source paper

Q154 JEE Main 2015 · 10 Apr · Online · MCQ

The area (in square units) of the region bounded by the curves $y+2x^2=0$ and $y+3x^2=1$, is equal to

(A) $\frac{3}{4}$ sq. units
(B) $\frac{1}{3}$ sq. units
(C) $\frac{3}{5}$ sq. units
(D) $\frac{4}{3}$ sq. units

Answer: (D) $\frac{4}{3}$ sq. units · Key from source paper

Q155 JEE Main 2015 · 4 Apr · Offline · MCQ

The area (in sq. units) of the region described by $[(x,y):\ y^2 \leq 2x \text{ and } y \geq 4x-1]$ is

(A) $\frac{9}{32}$ sq. units
(B) $\frac{7}{32}$ sq. units
(C) $\frac{5}{64}$ sq. units
(D) $\frac{15}{64}$ sq. units

Answer: (A) $\frac{9}{32}$ sq. units · Key from source paper

Q156 JEE Main 2014 · 19 Apr · Online MCQ

The area of the region (in square units) above the x-axis bounded by the curve $y = \tan x$, $0 \le x \le \frac{\pi}{2}$ and the tangent to the curve at $x = \frac{\pi}{4}$ is

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

Answer: (A) $\frac{1}{2}\left(\log 2 - \frac{1}{2}\right)$ · Key from source paper

---

Q157 JEE Main 2014 · 9 Apr · Online MCQ

Let $A = \{(x, y) : y^2 \le 4x,\ y - 2x \ge -4\}$. The area of the region A in square units is

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

Answer: (C) 9 · Key from source paper

Q158 JEE Main 2014 · 6 Apr · Offline MCQ

The area (in sq. unit) of the region described by $A = \{(x, y) : x^2 + y^2 \le 1 \text{ and } y^2 \le 1 - x\}$ is

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

Answer: (C) $\frac{\pi}{2} + \frac{4}{3}$ · Key from source paper

---

Q159 JEE Main 2013 · 23 Apr · Online MCQ

The area under the curve $y = |\cos x - \sin x|$, $0 \le x \le \frac{\pi}{2}$, and above x-axis is :

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

Answer: (B) $2\sqrt{2}-2$ · Key from source paper

Q160 JEE Main 2013 · 22 Apr · Online MCQ

The area of the region (in sq. units), in the first quadrant bounded by the parabola $y=9x^2$ and the lines $x=0, y=1$ and $y=4$, is :

(A) 7/9
(B) 14/3
(C) 7/3
(D) 14/9

Answer: (D) 14/9 · Key from source paper

Q161 JEE Main 2013 · 9 Apr · Online MCQ

The area bounded by the curve $y=\ln(x)$ and the lines $y=0, y=\ln(3)$ and $x=0$ is equal to:

(A) 3
(B) $3\ln(3)-2$
(C) $3\ln(3)+2$
(D) 2

Answer: (D) 2 · Key from source paper

Q162 JEE Main 2013 · 7 Apr · Offline MCQ

The area (in square units) bounded by the curves $y=\sqrt{x}$, $2y-x+3=0$, $X-$axis and lying in the first quadrant is

(A) 18 sq. units
(B) $\frac{27}{4}$ sq. units
(C) 9 sq. units
(D) 36 sq. units

Answer: (C) 9 sq. units · Key from source paper

Q163 AIEEE 2012 · 26 May · Online MCQ

The area bounded by the parabola $y^2=4x$ and the line $2x-3y+4=0$, in square unit, is

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

Answer: (B) $\frac{1}{3}$ · Key from source paper

Q164 AIEEE 2012 · 19 May · Online MCQ

The area of the region bounded by the curve $y = x^3$, and the lines, $y = 8$, and $x = 0$, is

(A) 8
(B) 12
(C) 10
(D) 16

Answer: (B) 12 · Key from source paper

Q165 AIEEE 2012 · 12 May · Online MCQ

The area enclosed by the curves $y = x^2, y = x^3, x = 0$ and $x = p$, where $p > 1$, is $1/6$. The p equals

(A) $8/3$
(B) $16/3$
(C) 2
(D) $4/3$

Answer: (D) $4/3$ · Key from source paper

Q166 AIEEE 2012 · 12 May · Online MCQ

If a straight line $y - x = 2$ divides the region $x^2 + y^2 \leq 4$ into two parts, then the ratio of the area of the smaller part to the area of the greater part is

(A) $3\pi - 8 : \pi + 8$
(B) $\pi - 3 : 3\pi + 3$
(C) $3\pi - 4 : \pi + 4$
(D) $\pi - 2 : 3\pi + 2$

Answer: (D) $\pi - 2 : 3\pi + 2$ · Key from source paper

Q167 AIEEE 2012 · 7 May · Online MCQ

The parabola $y^2 = x$ divides the circle $x^2 + y^2 = 2$ into two parts whose areas are in the ratio

(A) $9\pi + 2 : 3\pi - 2$
(B) $9\pi - 2 : 3\pi + 2$
(C) $7\pi - 2 : 2\pi - 3$
(D) $7\pi + 2 : 3\pi + 2$

Answer: (B) $9\pi - 2 : 3\pi + 2$ · Key from source paper

Q168 AIEEE 2012 · Offline MCQ

The area bounded between the parabolas $x^2 = \frac{y}{4}$ and $x^2 = 9y$, and the straight line $y = 2$ is

(A) $20\sqrt{2}$
(B) $\frac{10\sqrt{2}}{3}$
(C) $\frac{20\sqrt{2}}{3}$
(D) $10\sqrt{2}$

Answer: (C) $\frac{20\sqrt{2}}{3}$ · Key from source paper

Q169 AIEEE 2011 MCQ

The area of the region enclosed by the curves $y = x, x = e, y = \frac{1}{x}$ and the positive x-axis is

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

Answer: (B) $\frac{3}{2}$ **square units** · Key from source paper

---

Q170 AIEEE 2010 MCQ

The area bounded by the curves $y = \cos x$ and $y = \sin x$ between the ordinates $x = 0$ and $x = \frac{3\pi}{2}$ is

(A) $4\sqrt{2} + 2$
(B) $4\sqrt{2} - 1$
(C) $4\sqrt{2} + 1$
(D) $4\sqrt{2} - 2$

Answer: (D) $4\sqrt{2} - 2$ · Key from source paper

Q171 AIEEE 2009 MCQ

The area of the region bounded by the parabola $(y-2)^2 = x - 1$, the tangent to the parabola at the point $(2, 3)$ and the x-axis is

(A) 3
(B) 6
(C) 9
(D) 12

Answer: (C) 9 · Key from source paper

Q172 AIEEE 2008 MCQ

The area of the plane region bounded by the curves $x + 2y^2 = 0$ and $x + 3y^2 = 1$ is equal to

(A) $\frac{5}{3}$
(B) $\frac{1}{3}$
(C) $\frac{2}{3}$
(D) $\frac{4}{3}$

Answer: (D) $\frac{4}{3}$ · Key from source paper

Q173 AIEEE 2007 MCQ

The area enclosed between the curves $y^2 = x$ and $y = |x|$ is

(A) 2/3
(B) 1
(C) 1/6
(D) 1/3

Answer: (C) 1/6 · Key from source paper

Q174 AIEEE 2005 MCQ

The area enclosed between the curve $y = \log_e(x + e)$ and the coordinate axes is

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

Answer: (A) 1 · Key from source paper

Q175 AIEEE 2005 MCQ

The parabolas $\mathrm{y}^2 = 4\mathrm{x}$ and $\mathrm{x}^2 = 4\mathrm{y}$ divide the square region bounded by the lines $\mathrm{x} = 4,\ y = 4$ and the coordinate axes. If S_1, S_2, S_3 are respectively the areas of these parts numbered from top to bottom; then $\mathrm{S}_1 : \mathrm{S}_2 : \mathrm{S}_3$ is

(A) $1:2:1$
(B) $1:2:3$
(C) $2:1:2$
(D) $1:1:1$

Answer: (D) $1:1:1$ · Key from source paper

Q176 AIEEE 2004 MCQ

The area of the region bounded by the curves $y=|x-2|$, $x=1$, $x=3$ and the x-axis is

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

Answer: (A) 1 · Key from source paper

Q177 AIEEE 2003 MCQ

The area of the region bounded by the curves $y=|x-1|$ and $y=3-|x|$ is

(A) 6 sq. units
(B) 2 sq. units
(C) 3 sq. units
(D) 4 sq. units

Answer: (D) 4 sq. units · Key from source paper

Q178 AIEEE 2002 MCQ

The area bounded by the curves $y=\ln x, y=\ln|x|, y=|\ln x|$ and $y=|\ln||x||$ is

(A) 4 sq. units
(B) 6 sq. units
(C) 10 sq. units
(D) none of these

Answer: (A) 4 sq. units · Key from source paper

EdLoop JEE