

MATHEMATICS · JEE MAIN

Area Under Curves

Chapter-wise previous year questions, with answer key

11

PYQS

2021-2025

PAPERS

1

TOPICS

Area Between Two Curves

- 1 Attempt each question on paper first. They're grouped by topic, newest papers first.
- 2 Check yourself against the answer key at the end.
- 3 Got one wrong? Tap "Step-by-step solution" under it for the full working.

Stuck on a question?

Every question has a free step-by-step solution on PrepWiser: tap "Step-by-step solution" under it.

Practise this chapter online with instant answer checking: prepwisser.in/learn · No signup needed to browse

Answers follow NTA's final answer keys. Typing errors are possible, so check doubtful answers against the official key. Spotted a mistake? prepwisser.in/feedback · Terms: prepwisser.in/terms

Area Between Two Curves · 11 PYQs

Q1 JEE Main 2025 · 4 Apr · Shift 1

Let $f : [0, \infty) \rightarrow \mathbb{R}$ be a differentiable function such that

$$f(x) = 1 - 2x + \int_0^x e^{x-t} f(t) dt \text{ for all } x \in [0, \infty).$$

Then the area of the region bounded by $y = f(x)$ and the coordinate axes is

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

[Step-by-step solution ► prepwiser.in/questions/mKsPPhTj9](https://www.prepwiser.in/questions/mKsPPhTj9)

Q2 JEE Main 2025 · 24 Jan · Shift 1

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

- (A) 7 (B) $\frac{24}{5}$
(C) $\frac{20}{3}$ (D) 5

[Step-by-step solution ► prepwiser.in/questions/JrH7frpQH0](https://www.prepwiser.in/questions/JrH7frpQH0)

Q3 JEE Main 2025 · 22 Jan · Shift 2

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

[Step-by-step solution ► prepwiser.in/questions/cGsF3yIFhw](https://www.prepwiser.in/questions/cGsF3yIFhw)

Q4 JEE Main 2024 · 6 Apr · Shift 2

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

[Step-by-step solution ► prepwiser.in/questions/TQVPDILm3Q](https://www.prepwiser.in/questions/TQVPDILm3Q)

Q5 JEE Main 2024 · 5 Apr · Shift 1

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

Numerical answer: enter the value.

[Step-by-step solution ► prepwiser.in/questions/xps2mQeEH8](https://www.prepwiser.in/questions/xps2mQeEH8)

Q6 JEE Main 2024 · 1 Feb · Shift 2

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

Numerical answer: enter the value.

[Step-by-step solution ► prepwiser.in/questions/vjTVUSLHMx](https://www.prepwiser.in/questions/vjTVUSLHMx)

Q7 JEE Main 2024 · 29 Jan · Shift 1

If the points of intersection of two distinct conics $x^2 + y^2 = 4b$ and $\frac{x^2}{16} + \frac{y^2}{b^2} = 1$ lie on the curve $y^2 = 3x^2$, then $3\sqrt{3}$ times the area of the rectangle formed by the intersection points is _____.

Numerical answer: enter the value.

[Step-by-step solution ► prepwiser.in/questions/E-JRnoa2PI](https://www.prepwiser.in/questions/E-JRnoa2PI)

Q8 JEE Main 2023 · 25 Jan · Shift 1

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 answer: enter the value.

[Step-by-step solution ► prepwiser.in/questions/iF0FjeQBER](https://www.prepwiser.in/questions/iF0FjeQBER)

Q9 JEE Main 2022 · 26 Jul · Shift 1

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

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

[Step-by-step solution ► prepwiser.in/questions/KM7bkFF_6Z](https://www.prepwiser.in/questions/KM7bkFF_6Z)

Q10 JEE Main 2021 · 1 Sep · Shift 2

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

[Step-by-step solution ► prepwiser.in/questions/1EndKFuN3F](https://www.prepwiser.in/questions/1EndKFuN3F)

Q11 JEE Main 2021 · 26 Feb · Shift 1

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

Numerical answer: enter the value.

[Step-by-step solution ► prepwiser.in/questions/KOjhPLwHck](https://www.prepwiser.in/questions/KOjhPLwHck)

Answer key: Area Under Curves

Answers follow NTA's final answer keys. Typing errors are possible, so check doubtful answers against the official key. Spotted a mistake? prepwiser.in/feedback · Terms: prepwiser.in/terms

Numbers match the question numbers above. For full working, open the solution link under each question.

1	D	2	C	3	A	4	D	5	198	6	8	7	432	8	600
9	B	10	A	11	8										

Want the next chapter?

All Mathematics chapters, every JEE Main PYQ, free with solutions: prepwiser.in

PrepWiser is an independent practice platform and is not affiliated with the National Testing Agency (NTA). Questions are from official JEE Main papers; answers follow NTA's final answer keys.