

PART 1 - MATHEMATICS

Topic : Application of integrals, Trigonometric functions, Conic sections

SECTION-1 : (Maximum Marks : 3)

- This section contains **ONE** question.
- Each question has **FOUR** options (A), (B), (C) and (D). **ONLY ONE** of these four options is the correct answer.
- For each question, choose the option corresponding to the correct answer.
- Answer to each question will be evaluated according to the following marking scheme :
 Full Marks : +3 If **ONLY** the correct option is chosen;
 Zero Marks : 0 If none of the options is chosen (i.e. the question is unanswered);
 Negative Marks : -1 In all other cases.

1. Let R denote the set of all real numbers. Then the area of the region

$$\left\{ (x, y) \in \mathbb{R} \times \mathbb{R} : x > 0, y > \frac{1}{x}, 5x - 4y - 1 > 0, 4x + 4y - 17 < 0 \right\}$$

is

[JEE Advanced 2025 Paper 2]

- (A) $\frac{17}{16} - \log_e 4$ (B) $\frac{33}{8} - \log_e 4$ (C) $\frac{57}{8} - \log_e 4$ (D) $\frac{17}{2} - \log_e 4$

Scan or tap for the full solution



Space for Rough Work

SECTION-2 : (Maximum Marks : 8)

- This section contains **TWO** paragraphs.
- Based on each paragraph, there are **TWO** questions.
- The answer to each question is a **NUMERICAL VALUE**.
- For each question, enter the correct numerical value of the answer (in decimal notation, truncated / rounded-off to the **SECOND DECIMAL PLACE**; e.g. 6.25, 7.00, -0.33, -.30, 30.27, -127.30) in the place designated to enter the answer.
- Answer to each question will be evaluated according to the following marking scheme :
Full Marks : +2 If ONLY the correct answer is entered;
Zero Marks : 0 In all other cases.

Paragraph for Questions 2 and 3

Consider the curve C_1 given by

$$y = e^{-x} \text{ for } x \in [0, 10\pi],$$

and the curve C_2 given by

$$y = e^{-x}(\sin x + \cos x) \text{ for } x \in [0, 10\pi].$$

Let n be the total number of points of intersection of the curves C_1 and C_2 .

Suppose that $\alpha_1, \alpha_2, \dots, \alpha_n \in [0, 10\pi]$ are the x -coordinates of the points of intersection of the curves C_1 and C_2 such that

$$\alpha_1 < \alpha_2 < \dots < \alpha_n.$$

2. The value of n is _____.

[JEE Advanced 2026 Paper 2]

Scan or tap for the
full solution



3. Let β be the area of the region enclosed between the curves C_1 , C_2 , and the lines $x = \alpha_1$ and $x = \alpha_4$. Then the value of

$$-\frac{1}{\pi} \log_e \left(\beta - 2e^{-\frac{\pi}{2}} \right)$$

is _____.

[JEE Advanced 2026 Paper 2]

Scan or tap for the
full solution

**Paragraph for Questions 4 and 5**

Consider the ellipses given by

$$x^2 + 4y^2 = 1 \text{ and } 4x^2 + y^2 = 1.$$

4. Let P be the point in the first quadrant where the given ellipses intersect. If θ is the acute angle between the tangents to the given ellipses at the point P , then the value of $4\tan \theta$ is _____.

[JEE Advanced 2026 Paper 2]

Scan or tap for the
full solution



Space for Rough Work

5. If α is the area of the common region that lies inside both the given ellipses, then the value of $\cot \alpha$ is _____.

[JEE Advanced 2026 Paper 2]

Scan or tap for the
full solution



Space for Rough Work

Test Pattern : **JEE (Advanced)**

Ques.	2	3	4	5								
Ans.	11	2.4 to 2.6	7.4 to 7.6	0.74 to 0.76								