



Application of Integrals

Q.No.1:

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 :

JEE 2013

- A. 9
- B. 36
- C. 18
- D. $\frac{27}{4}$

Q.No.2:

The intercepts on x -axis made by tangents to the curve, $y = \int_0^x |t| dt$, $x \in \mathbb{R}$, which are parallel to the line $y = 2x$, are equal to:

JEE 2013

- A. ± 1
- B. ± 2
- C. ± 3
- D. ± 4

Q.No.3: The area (in sq. units) of the region described by $\{(x, y) : y^2 \leq 2x \text{ and } y \geq 4x - 1\}$ is :

JEE 2015

- A. $\frac{7}{32}$
- B. $\frac{5}{64}$
- C. $\frac{15}{64}$
- D. $\frac{9}{32}$

Q.No.4: 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 :

JEE 2016

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

Q.No.5: 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 :

JEE 2017

- A. $\frac{59}{12}$
- B. $\frac{3}{2}$
- C. $\frac{7}{3}$
- D. $\frac{5}{2}$

Q.No.6: Let $g(x) = \cos x^2$, $f(x) = \sqrt{x}$, and α, β ($\alpha < \beta$) 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 $y = (g \circ f)(x)$ and the lines $x = \alpha$, $x = \beta$ and $y = 0$, is :

JEE 2018

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

Q.No.7: 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:

JEE 2019

- A. $\frac{8}{3}$
- B. $\frac{32}{3}$
- C. $\frac{56}{3}$

D. $\frac{14}{3}$

Q.No.8: 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: **JEE 2019**

A. $\frac{2}{3}$

B. 2

C. $\frac{4}{3}$

D. $\frac{1}{3}$

Q.No.9: If the area enclosed between the curves $y = kx^2$ and $x = ky^2$, ($k > 0$), is 1 square unit. Then k is: **JEE 2019**

A. $\frac{\sqrt{3}}{2}$

B. $\frac{1}{\sqrt{3}}$

C. $\sqrt{3}$

D. $\frac{2}{\sqrt{3}}$

Q.No.10: 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: **JEE 2019**

A. $\frac{8}{3}$

B. $\frac{37}{24}$

C. $\frac{187}{24}$

D. $\frac{14}{3}$