SmartKalike

CBSE Class 12 · Maths

Application of Integrals

10 most probable questions for Boards 2027

Q1. 1 mark · Very short answer

Find the total area between y = x − 1 and the x-axis from x = 0 to x = 2 by adding the absolute areas on either side of the x-axis.

Answer

$\int_0^1 (1 - x)\,dx + \int_1^2 (x - 1)\,dx$

$= 1/2 + 1/2$

$\therefore$ Total area = 1 square unit

Q2. 2 marks · Short answer

Using horizontal strips, find the area bounded by $x = y^2$, the y-axis, y = 0 and y = 2.

Answer

$A = \int_0^2 x\,dy$

$= \int_0^2 y^2\,dy$

$= [y^3/3]_0^2$

$\therefore$ A = 8/3 square units

Q3. 3 marks · Medium answer

Find the area under y = x between x = 0 and x = 2 by expressing the definite integral as a limit of a sum.

Answer

$\Delta x = 2/n$

$x_r = 2r/n$, r = 1, 2, ..., n

$\text{Area} = \lim_{n\to\infty} \Sigma_{r=1}^{n} f(x_r)\Delta x$

$= \lim_{n\to\infty} \Sigma_{r=1}^{n} (2r/n)(2/n)$

$= \lim_{n\to\infty} (4/n^2) \cdot n(n + 1)/2$

$= \lim_{n\to\infty} 2(n + 1)/n$

$\therefore$ Area = 2 square units

Q4. 4 marks · Long answer

Find the geometric area bounded by y = −x, the x-axis, x = 0 and x = 2. Evaluate the definite integral and use its absolute value as the area.

Answer

$\int_0^2 (-x)\,dx = [-x^2/2]_0^2$

$= -2$

$\text{Area} = |-2|$

$\therefore$ Area = 2 square units

Q5. 5 marks · Long answer

Find the area under $y = 4 - x^2$ and above the x-axis between $x = 0$ and $x = 2$ by evaluating the definite integral of the curve over that interval.

Answer

$dA = y\,dx$
$= (4 - x^2)\,dx$
$A = \int_0^2 (4 - x^2)\,dx$
$= [4x - x^3/3]_0^2$
$= (8 - 8/3) - 0$
$\therefore A = 16/3$ square units

Q6. 1 mark · Multiple choice

The circle $x^2 + y^2 = a^2$ is symmetric about both coordinate axes. If the area in its first quadrant is Q, which expression gives the area enclosed by the whole circle?
(A) Q (B) 2Q (C) 3Q (D) 4Q

Full answer on SmartKalike: https://smartkalike.com/cbse/class-12/maths/application-of-integrals

Q7. 2 marks · Short answer

Find the area enclosed by the ellipse $x^2/9 + y^2/4 = 1$.

Full answer on SmartKalike: https://smartkalike.com/cbse/class-12/maths/application-of-integrals

Q8. 3 marks · Medium answer

For $y = x^2$ on $0 \le x \le 2$, write the area dA of a thin vertical strip and form the definite integral that adds all such strips. Evaluate the integral.

Full answer on SmartKalike: https://smartkalike.com/cbse/class-12/maths/application-of-integrals

Q9. 2 marks · Short answer

Using integration, find the total area bounded by the line $y = 3x + 2$, the x-axis, and the ordinates $x = -1$ and $x = 1$. Split the integral at the point where the line meets the x-axis.

Full answer on SmartKalike: https://smartkalike.com/cbse/class-12/maths/application-of-integrals

Q10. 2 marks · Short answer

Evaluate the total area bounded by $y = \cos x$ and the x-axis between $x = 0$ and $x = 2\pi$, splitting the interval at the zeros of cos x.

Full answer on SmartKalike: https://smartkalike.com/cbse/class-12/maths/application-of-integrals

Unlock all answers on SmartKalike

Every probable question of every chapter, each with a full answer, plus study targets and answer-sheet checking.

https://smartkalike.com/cbse/class-12/maths/application-of-integrals

Sign up with a friend's email for 30% off their first purchase.