APPLICATION OF INTEGRALS

INTRODUCTION, AREA UNDER SIMPLE CURVES

EXERCISE

Q.1 The region enclosed by the parabola $y = x^2$ and the line $y = 2x$ (in square units) is:

(a) $\frac{2}{3}$ (b) $\frac{4}{3}$ (c) $\frac{8}{3}$ (d) 4

Q.2 The area enclosed by the curve $y = \cos x$, from $x = 0$ to $x = \pi$, is:

(a) 2 sq units (b) 4 sq units (c) 3 sq units (d) 1 sq units

Q.3 The area enclosed by the curve $y = \sqrt{16 - x^2}$ and the x-axis is:

(a) 8 π sq units (b) 20 π sq units (c) 16 sq π units (d) 256 π sq units

Q.4 The area enclosed by the ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ is equivalent to:

(a) $\pi^2 ab$ (b) π ab (c) $\pi a^2 b$ (d) πab^2

Q.5 Determine the area of the region (in square units) enclosed by the curve $y^2 = 2y - x$ & y-axis and the y-axis.

(a) $\frac{8}{3}$ (b) $\frac{4}{3}$ (c) $\frac{5}{3}$ (d) $\frac{2}{3}$

Q.6 What is the area enclosed by the parabola $x^2 = y$ and the line $y = 1$?

(a) $\frac{1}{3}$ sq units (b) $\frac{2}{3}$ sq units (c) $\frac{4}{3}$ sq units (d) 2 sq units

Q.7 The area enclosed by the curve $y = x^2$ and the line $y = 16$ is:

(a) $\frac{32}{3}$ (b) $\frac{265}{3}$ (c) $\frac{64}{3}$ (d) $\frac{128}{3}$

Q.8 Determine the area enclosed by the curve $y = 4x^3$ within the interval $x = [-2, 3]$.

(a) 97 (b) 70 (c) 65 (d) 77

Q.9 The area beneath the curve $y = x^2$ and the lines $x = -1$, $x = 2$, and the x-axis is:

(a) 3 sq units (b) 5 sq units (c) 7 sq units (d) 9 sq units

Q.10 The area beneath the curve $y = x^4$ and the lines $x = 1$, $x = 5$, and the x-axis is:

(a) $\frac{3124}{3}$ sq units (b) $\frac{3124}{7}$ sq units (c) $\frac{3124}{5}$ sq units (d) $\frac{3124}{9}$ sq units

Q.11 The integral to determine the area of a circle with radius 'a' is given by:

(a) $\int_a^b \left(a^2 + x^2\right) dx$ (b) $\int_0^{2\pi} \sqrt{\left(a^2 - x^2\right)} dx$

(c) $4 \times \int_0^a \sqrt{\left(a^2 - x^2\right)} dx$ (d) $\int_0^a \sqrt{\left(a^2 - x^2\right)} dx$

Q.12 Determine the area enclosed by the curve $y = x^3$, the line $x = 2$, $x = 5$, and the x-axis.

(a) 173.50 (b) 230.25 (c) 175.35 (d) 152.25

Q.13 The region enclosed by the parabola $x = 4 - y^2$ and the y-axis, measured in square units, is:

(a) $\frac{2}{32}$ sq units (b) $\frac{32}{3}$ sq units (c) $\frac{33}{2}$ sq units (d) None of these

ANSWER KEY

1. (b)
2. (a)
3. (a)
4. (b)
5. (b)
6. (c)
7. (b)

8. (a)

9. (a)

10. (c)

11. (c)

12 (d)

13. (b)