Applications of the Integrals previously asked

12th Standard

Maths

Multiple Choice Question   3 x 1 = 3

1) Area of the region bounded by the curve $y^2 = 4x$ and the X-axis between x = 0 and x = 1 is

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

2) The area of the region bounded by the curve $y^2 = 4x$ and x = 1 is

(a) $\frac{4}{3}$ (b) $\frac{8}{3}$ (c) $\frac{64}{3}$ (d) $\frac{32}{3}$

3) The area bounded by the curve $y = \sqrt{x}$, Y-axis and between the lines y = 0 and y = 3 is

(a) $2\sqrt{3}$ (b) 27   (c) 9   (d) 3

2 Marks   1 x 2 = 2

4) Find the area of the ellipse $x^2 + 9y^2 = 36$ using integration.

3 Marks   21 x 3 = 63

5) Using integration find the area of the circle $x^2 + y^2 = 16$ which is exterior to the parabola $y^2 = 6x$.

6) Find the area of the region lying between the parabolas $y^2 = 4ax$ and $x^2 = 4ay$, where a > 0.

7) Using integration find the area of the region bounded by the parabola $y = x^2$ and the line y =x

8) Using integration find the area of the region bounded by the parabola $y^2 = 4x$ and the circle $4x^2 + 4y^2 = 9$.

9) Find the area of the region included between the parabola $y = \frac{3}{4}x^2$ and the line 3x - 2y + 12 =0.

10) Find the area bounded by the lines x + 2y = 2, y - x = 1 and 2x + y = 7.

11) Find the area of the region included between the parabola $y^2 = x$ and the line x + y =2.

12) Using integration find the area of the region: {(x, y): $9x^2 + y^2 \le 36$ and $3x + y \ge 6$ }.

13) Using integration find the area of the following region:
$\left\{(x, \quad y) : \frac{x^2}{9} + \frac{y^2}{4} \le \frac{x}{3} + \frac{y}{2}\right\}$

14) Using integration find the area of the following region: $\left\{(x, \quad y) : |x + 2| \le y \le \sqrt{20 - x^2}\right\}$

15) Sketch the graph of $y = |x + 3|$ and evaluate the area under the curve $y = |x + 3|$ above x-axis and between x = -6 to x = 0.

16) USing the method of integration find the area of the region bounded by the lines 3x - 2y + 1 = 0, 2x + 3y - 21 =0 and x - 5y + 9 = 0.

17) Find the area of the region $\left\{(x, \quad y) : x^2 + y^2 \le 4, \quad x + y \ge 2\right\}$

18) Find the area of the region bounded by the curve $x^2 = 4y$ and the line x = 4y - 2.

19) Using integration, find the area of the region enclosed between the two circles $x^2 + y^2 = 4$ and $(x-2)^2 + y^2 = 4$.

20) Using integration, find the area of the region enclosed by the curves $y^2 = 4x$ and y = x.

21) Using integration, find the area of the triangular region whose sides have the equations:
y = 2x + 1, y = 3x + 1and x = 4.

22) Using the method of integration, find the area of the region bounded by the lines:
3x - 2y + 1 = 0, 2x + 3y - 21 = 0 and x - 5y + 9 = 0

23) Find the area included between the curves $y^2 = 4ax$ and $x^2 = 4ay$, a > 0.

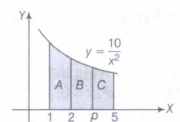24) Find the area of the region bounded by the y-axis, y = cos x and y = sin x, $0 \leq x \leq \frac{\pi}{2}$.

25) Using integration, find the area of the region bounded by y= mx (m > 0), x = 1, x = 2 and the X-axis.

5 Marks   5 x 5 = 25

26) Draw the graph of y = |x+1| and using integration find the area below y = |x+1| above x-axis and between x = -4 to x = 2.

27) The figure shows the part of the curve $y = \frac{10}{x^2}$. Find the area of region A. Also, find the value of p, for which region B and region Care equal in area.

28) Using integration, fmd the area of the region in the first quadrant enclosed by the x-axis, the line y = x and the circle $x^2 + y^2 = 32$

29) Draw the graphs of y = sin x and y = cos x. Find the area of the region bounded by the X-axis
$y = \cos x$ and $y = \sin x$, where $0 \leq x \leq \frac{\pi}{2}$

30) Find the area of the region bounded by the curve $4x^2 + y^2 = 36$ using integration.

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