DCAM classes
Dynamic Classes for Academic Mastery

Areas by integration-CBSE

6 Marks Questions

1. Using integration, find the area of ΔABC, the coordinates of whose vertices are $A(2, 5)$, $B(4, 7)$ and $C(6, 2)$.

2. Using integration, find the area of triangle whose vertices are (2, 3), (3, 5) and (4, 4).

Test-1

3. Find the area of the region lying above X-axis and included between the circle $x^2 + y^2 = 8x$ and inside the parabola $y^2 = 4x$.

4. Using integration, prove that the curves $y^2 = 4x$ and $x^2 = 4y$ divide the area of the square bounded by $x = 0$, $x = 4$, $y = 4$ and $y = 0$ into three equal parts.

5. Using method of integration, find the area of the triangle whose vertices are (1, 0), (2, 2) and (3, 1).

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

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

8. Find the area of the region in the first quadrant enclosed by the X-axis, the line $y = x$ and the circle $x^2 + y^2 = 32$.

9. Using integration, find the area of the region : $\{(x, y): 0 \le 2y \le x^2, 0 \le y \le x, 0 \le x \le 3\}$.

10. Using integration, find the area of region bounded by the triangle whose vertices are (−2, 1), (0, 4) and (2, 3).

11. Find the area bounded by the circle $x^2 + y^2 = 16$ and the line $\sqrt{3}y = x$ in the first quadrant, using integration.

12. Using the method of integration, find the area of the ΔABC, coordinates of whose vertices are $A(4, 1)$, $B(6, 6)$ and $C(8, 4)$.

13. Find the area enclosed between the parabola $4y = 3x^2$ and the straight line $3x - 2y + 12 = 0$.

14. Using integration, find the area of the region $\{(x, y): x^2 + y^2 \le 2ax, y^2 \ge ax; x, y \ge 0\}$.

15. Using integration, find the area of the triangular region whose vertices are (2, − 2), (4, 3) and (1, 2).

16. Using integration, find the area of the region bounded by the curves $y=\sqrt{4-x^2}$, $x^2+y^2-4x=0$ and the X-axis.

17. Using integration, find the area of the region in the first quadrant enclosed by the Y-axis, the line $y=x$ and the circle $x^2+y^2=32$.

18. Using integration, find the area of the triangle formed by positive X-axis and tangent and normal to the circle $x^2+y^2=4$ at $(1,\sqrt{3})$.

19. Using integration, find the area of the region bounded by the line $x-y+2=0$, the curve $x=\sqrt{y}$ and Y-axis.

20. Find the area of the region $\{(x,y): y^2 \le 4x, 4x^2+4y^2 \le 9\}$, using method of integration.

21. Using integration, find the area of the region in the first quadrant enclosed by the X-axis, the line $y=x$ and the circle $x^2+y^2=18$.

22. Using integration, find the area of the region bounded by the curves $y=|x+1|+1, x=-3, x=3$ and $y=0$.

23. Using integration, find the area of ΔPQR, coordinates of whose vertices are $P(2,0)$, $Q(4,5)$ and $R(6,3)$.

24. Using integration, find the area of the region bounded by the triangle whose vertices are $(-1,2),(1,5)$ and $(3,4)$.

25. Find the area of the smaller region bounded by the ellipse $\frac{x^2}{9}+\frac{y^2}{4}=1$ and the line $\frac{x}{3}+\frac{y}{2}=1$.

Or Using integration, find the area of the following region.

Test-1

$$\left\{(x,y): \frac{x^2}{9}+\frac{y^2}{4} \le 1 \le \frac{x}{3}+\frac{y}{2}\right\}$$

26. Using integration, find the area of the region bounded by the lines $2x+y=4$, $3x-2y=6$ and $x-3y+5=0$.

27. Using integration, find the area bounded by the curve $x^2=4y$ and the line $x=4y-2$.

28. Using integration, find the area of the region bounded by the curves $y=x^2$ and $y=x$.

29. Find the area of the region $\{(x,y): y^2 \le 6ax$ and $x^2+y^2 \le 16a^2\}$, using method of integration.

30. Find the area of the region bounded by the parabola $y=x^2$ and the line $y=|x|$.

Or Find the area of the region given by $\{(x,y): x^2 \le y \le |x|\}$.

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

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

33. Using integration, find the area of the region bounded by the lines $3x-y-3=0$, $2x+y-12=0$, $x-2y-1=0$.

34. Using integration, find the area of the region bounded by the lines $5x-2y-10=0$, $x+y-9=0$ and $2x-5y-4=0$.

35. Find the area of the region $\{(x,y): x^2+y^2 \le 4, x+y \ge 2\}$.

36. Find the area of the region $\{(x,y): (x^2+y^2) \le 1 \le x+y\}$.

37. 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 $x=0$.

38. Using integration, find the area of the region $\{(x, y) : x^2 + y^2 \le 16, x^2 \le 6y\}$

Test-1

39. Find the area of circle $4x^2 + 4y^2 = 9$ which is interior to the parabola $x^2 = 4y$.

40. Using integration, find the area of the following region.

$\{(x, y) : |x - 1| \le y \le \sqrt{5 - x^2}\}$

Test-1

Answers

1) 7 sq unit.

2) $3/2$ sq. unit.

3) $\frac{4}{3}(8+3\pi)$ sq. unit.

4) $\frac{16}{3}$ sq. unit

5) $3/2$ sq. unit

6) $\frac{8\pi}{3} - 2\sqrt{3}$

7) 8

8) 4π

9) $\frac{23}{6}$

10) 4

11) $\frac{4\pi}{3}$

12) 7

13) 27

14) $a^2\left(\frac{\pi}{4} - \frac{2}{3}\right)$

15) $\frac{13}{2}$

16) $\frac{4\pi}{3} - \sqrt{3}$

17) 4π

18) $2\sqrt{3}$

19) $10/3$

20) $\frac{1}{3\sqrt{2}} + \frac{9\pi}{8} - \frac{9}{4}\sin^{-1}\left(\frac{1}{3}\right)$

21) $\frac{9\pi}{4}$

22) 16

23) 7

24) 4

25) $\frac{3}{2}(\pi - 2)$

26) $\frac{7}{2}$

27) $9/8$

28) $1/6$

29) $\frac{4\sqrt{3}}{3}a^2 + \frac{16a^2\pi}{3}$

30) $1/3$

31) $\frac{4}{3}(8\pi - \sqrt{3})$

32) $13/2$

33) 10

34) $27/2$

35) $\pi - 2$

36) $\frac{\pi}{4} - \frac{1}{2}$

37) 9

38.) $\frac{4\sqrt{3}}{3} + \frac{16\pi}{3}$

39) $\frac{\sqrt{2}}{6} + \frac{9}{4}\sin^{-1}\left(\frac{2\sqrt{2}}{3}\right)$

40) $\left[\frac{5}{2}\left(\sin^{-1}\frac{2}{\sqrt{5}} + \sin^{-1}\frac{1}{\sqrt{5}}\right) - \frac{1}{2}\right]$