

TOPIC: APPLICATION OF INTEGRATION

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1. Find the area of the region
 $\{(x, y): y^2 \geq 6x, x^2 + y^2 \leq 16\}$
2. Using integration, find the area of triangular region whose vertices are (1,0), (2,2) and (3,1).
3. Find the area of the region bounded by the parabolas $y^2 = 4ax$ and $x^2 = 4ay$.
4. Find the area of the region in the first quadrant enclosed by the X – axis, the line $y = x$ and the circle $x^2 + y^2 = 32$.
5. Using integration, find the area of the region in the first quadrant enclosed by the X – axis, the line $y = x$ and the circle $x^2 + y^2 = 18$.
6. Using integration, find the area of the region bounded by the curves.
 $y = |x+1| + 1, x = -3, x = 3$ and $y = 0$
7. Using integration, find the area of the $\triangle PQR$, coordinates of whose vertices are P(2, 0), Q(4,5) and R (6,3).
8. Find the area of the region enclosed by the parabola $y^2 = x$ and the line $x + y = 2$
9. Find the area of the region enclosed between two circles $x^2 + y^2 = 9$ and $(x - 3)^2 + y^2 = 9$.
10. 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.
11. Using integration, find the area of the region bounded by the triangle whose vertices are (-1,2), (1,5) and (3,4).
12. Find the area of the smaller region bounded by the ellipse $\frac{x^2}{9} + \frac{y^2}{4} = 1$ and the line $\frac{x}{3} + \frac{y}{2} = 1$
13. Using method of integration, find the area of the region bounded by the lines $2x + y = 4, 3x - 2y = 6$ and $x - 3y + 5 = 0$
14. Using method of integration, find the area of region bounded by lines $3x - 2y + 1 = 0, 2x + 3y - 21 = 0$ and $x - 5y + 9 = 0$.

15. Find the area of the region
 $\{(x,y): x^2 + y^2 \leq 4, x + y \geq 2\}$.
16. Using integration, find the area of the triangular region whose sides have the equations $y = 2x + 1$, $y = 3x + 1$ and $x = 4$.
17. Find the area of the region bounded by ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ and the straight line $\frac{x}{a} + \frac{y}{b} = 1$
18. Using integration, find the area of the region bounded by the triangle whose vertices are (1,3) (2,5) and (3,4).
19. Find the area of the region bounded by the region enclosed by the curves $(x - 6)^2 + y^2 = 36$ and $x^2 + y^2 = 36$
20. Find the area enclosed by the parabola $4y = 3x^2$ and the line $3x - 2y + 12 = 0$.
21. Using integration, find the area bounded by the curve $x^2 = 4y$ and the line $x = 4y - 2$.
22. Using integration, find the area of the region bounded by the curve $y = x^2$ and $y = x$.
23. Using integration, find the area of the region enclosed between the two circles $X^2 + y^2 = 4$ and $(x - 2)^2 + y^2 = 4$.
24. Using integration, find the area of $\triangle ABC$, coordinates of whose vertices are A(4,1), B(6,6) and C(8,4).
25. Find the area of circle $4x^2 + 4y^2 = 9$ which is interior to the parabola $x^2 = 4y$.
26. Using integration, find the area of the following region.
 $\{(x, y) : |x - 1| \leq y \leq \sqrt{5 - x^2}\}$
27. Using integration, find the region bounded by ellipse $\left\{ \frac{x^2}{9} + \frac{y^2}{4} \leq 1 \leq \frac{x}{3} + \frac{y}{2} \right\}$
28. Find the area of the region $\{(x,y): y^2 \leq 4x, 4x^2 + 4y^2 \leq 9\}$, using method of integration.
29. Find the area of the region $\{(x,y): y^2 \leq 6ax \text{ \& } x^2 + y^2 \leq 16a^2\}$, using method of integration.
30. Find the area of the region bounded by the parabola $y = x^2$ and $y = |x|$.

Or

Find the area of the region given by

$$\{(x,y): x^2 \leq y \leq |x|\}$$

31. 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 $x = 0$.

32. Using integration, find the area of the region,

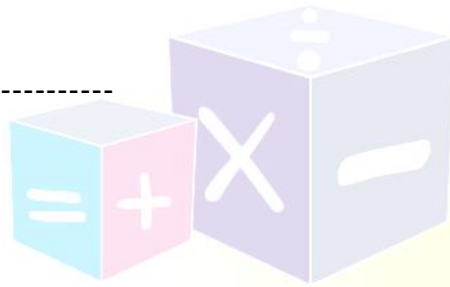
$$\{(x,y): x^2 + y^2 \leq 16, x^2 \leq 6y\}$$

33. Find the area of the region

$$\{(x,y): (x^2 + y^2) \leq 1 \leq x + y\}$$

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

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