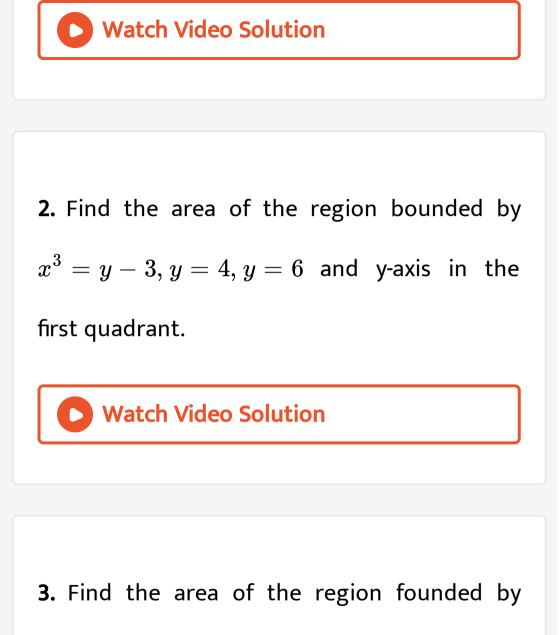# MATHS

BOOKS - ACCURATE PUBLICATION

APPLICATIONS OF INTEGRALS

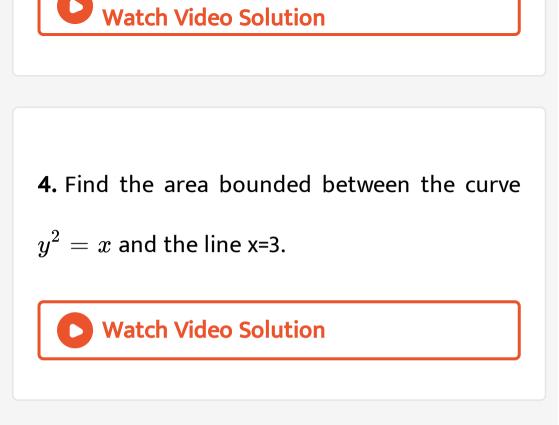**Example**

1. Find the area of the region bounded by $x^2 = 4y$, $y = 2$, $y = 4$ and the y-axis in the first quadrant.

2. Find the area of the region bounded by $x^3 = y - 3$, $y = 4$, $y = 6$ and y-axis in the first quadrant.

3. Find the area of the region founded by $x^2 = 16y$, $y = 1$, $y = 4$ and the y-axis in the first quadrant.

4. Find the area bounded between the curve $y^2 = x$ and the line x=3.
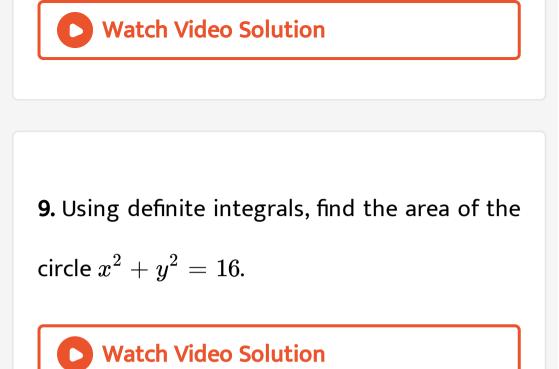
5. Find the area of the region bounded by the curve $y^2 = 4x$ and the line $x = 3$.

6. Using integration, find the area of the circle $x^2 + y^2 = 4$

7. The area of the circle $x^2 + y^2 = 9$ is :

8. Using integration, find the area of the region bounded by the curve $x^2 + y^2 = 16$ in the first quadrant.

9. Using definite integrals, find the area of the circle $x^2 + y^2 = 16$.

10. Find the area of the region bounded by ellipse $\dfrac{x^2}{16} + \dfrac{y^2}{9} = 1$.

11. Using integration find the area of region bounded by the ellipse $\dfrac{x^2}{25} + \dfrac{y^2}{16} = 1$

▶ **Watch Video Solution**

12. Using integration find the area of region bounded by the ellipse $\dfrac{x^2}{16} + \dfrac{y^2}{25} = 1$

▶ **Watch Video Solution**

13. Find the area of the region bounded by the elipse $\dfrac{x^2}{9} + \dfrac{y^2}{4} = 1$

14. Using definite integral find the area of the ellipse $\dfrac{x^2}{a^2} + \dfrac{y^2}{b^2} = 1$

15. Find the area of the region in the first quadrant enclosed by x-axis, line $x = (\sqrt{3})y$ and the circle $x^2 + y^2 = 4$.

16. Find the area bounded by the curve $y = x^2$ and the line y = x.

17. Find the area of the region enclosed by the parabola $y^2 = 4x$ and the line $y = 2x$.

18. Find the area of the region enclosed by the parabola $y^2 = 4x$ and the line $y = 2x$.

19. Find the area of the region enclosed by the parabola $y^2 = 9x$ and the line $y = 3x$.

> ▶ **Watch Video Solution**

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

> ▶ **Watch Video Solution**

21. Find the area of the region enclosed by the parabola $x^2 = y$, the line $y = x + 2$ and the x-axis.

> ▶ **Watch Video Solution**

22. Using integration, find the area of the region bounded by: (i) (2,0),(4,5) and (6,3).

> ▶ **Watch Video Solution**

23. Using integration find the area of the region bounded by the triangle whose vertices are (1,0), (3, 6) and (5, 2). Also draw the rough sketch of bounded region.

▶ Watch Video Solution

24. Using integration find the area of triangle ABC, coordinates of whose vertices are A (2, 0), B (4, 5), C (6, 3).

▶ Watch Video Solution

25. Using integration find the area of triangle with vertices (5, 1), (5, 3) and (7, 0).

▶ Watch Video Solution

26. Using integration find the area of triangle with vertices (4, 3), (4, 1) and (6, 0).

▶ Watch Video Solution

27. Using integration find the area of triangle with vertices (3, 3), (3, 1) and (5, 0).

▶ **Watch Video Solution**

28. Using integration find the area of the region bounded by the triangle whose vertices are (1,0), (3, 6) and (5, 2). Also draw the rough sketch of bounded region.

▶ **Watch Video Solution**

29. Using integration, find the area of the triangle ABC, co ordinate of whose vertics are A(2,0),B(4,5) and C(6,3).

▶ **Watch Video Solution**

30. Using integration, find the area of region of triangle whose vertices are

(3,0),(4,5) and (5,1)

▶ **Watch Video Solution**

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

32. Find the area of smaller region founded by the ellipse $\dfrac{x^2}{9} + \dfrac{y^2}{4} = 1$ and the straight line $\dfrac{x}{3} + \dfrac{y}{2} = 1$

33. Find the area of the smaller region bounded by the (ii) $\dfrac{x^2}{16} + \dfrac{y^2}{9} = 1$ and the straight line 3x+4y=12.

34. Find the area bounded by the region given by :

$$A = \left\{ (x, y) : (x, y) : \dfrac{x^2}{25} + \dfrac{y^2}{9} \le 1 \le \dfrac{x}{5} + \dfrac{y}{3} \right\}$$

.

35. Draw the rough sketch and find the area of the region :
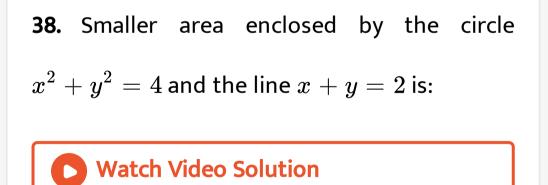
$$\{(x, y) : 4x^2 + y^2 \leq 4, \, 2x + y \geq 2\}.$$

▶ Watch Video Solution

36. Draw the rough sketch and find the area of the region :

$$\{(x, y) : 9x^2 + y^2 \leq 9, \, 3x + y \geq 3\}.$$

▶ Watch Video Solution

37. Find the area of the smaller region bounded by the ellipse $\dfrac{x^2}{a^2} + \dfrac{y^2}{b^2} = 1$ and the straight line $\dfrac{x}{a} + \dfrac{y}{b} = 1$ (using integration)

▶ Watch Video Solution

38. Smaller area enclosed by the circle $x^2 + y^2 = 4$ and the line $x + y = 2$ is:

▶ Watch Video Solution

39. Find the smaller area enclosed by the circle $x^2 + y^2 = 9$ and the line $x + y = 3$.

▶ Watch Video Solution

40. Find the smaller area enclosed by the circle $x^2 + y^2 = 9$ and the line $x + y = 3$.

▶ Watch Video Solution

Questions Carrying 2 Marks

1. Find the area of region bounded by $y^2 = 4x$, $x = 1$, $x = 4$ and x axis in the first quadrant.

2. Draw a graph of $\dfrac{x^2}{16} + \dfrac{y^2}{9} = 1$ and evaluate area bounded by it.

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

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

5. Using integration, find the area of the region bounded by the line x - y + 2 = 0, the curve $x = \sqrt{y}$ and y-axis.
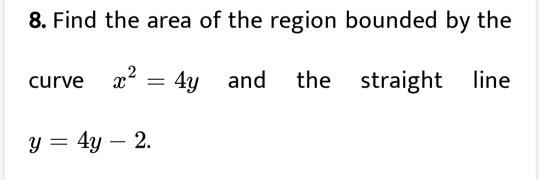
6. Find the area of the region enclosed by the curve $y^2 = 4x$ and the line $y = x$

7. Using integration, find the area of the region bounded by the line y - 1 = x, the x-axis and the ordinates x = -2 and x = 3.

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

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

10. Draw the rough sketch and find the area of the region: (i)$\{(x, y) : x^2 < y < x + 2\}$

11. Using integration find the area of region bounded by the triangle where vertices are : (-1,2), (1,5) and (3,4)

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

13. Using integration, find the area of the region: $\left\{ (x, y) : |x - 1| \leq y \leq \sqrt{5 - x^2} \right\}$.

14. Find the area of the region: (ii) $\left\{ (x, y) : x^2 \leq y \leq |x| \right\}$.

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

16. Using integration, find the area of the region bounded by the following curves, after making a rough sketch: (i) y=1+|x+1|,x=-3,x=3,y=0.

17. 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.