MATHS

BOOKS - KUMAR PRAKASHAN KENDRA MATHS (GUJRATI ENGLISH)

APPLICATION OF INTEGRALS

Practice Work

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

2. Find the area of the region bounded by parabola $y = \dfrac{x^2}{4}$ and the lines $y = x, y = 1$ in the first quadrant .

3. Find the area of the region bounded by parabola $y = 2x^2 + 10$ and the line $y = 4x + 16.$

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

5. Prove that the area of the circle with radius r is πr^2

6. Find the area of the region bounded by the curve $y = 2x - x^2$ and X- axis.

7. Find the area of the ellipse $\dfrac{x^2}{a^2} + \dfrac{y^2}{b^2} = 1(a > b)$

.

8. Find the area of the region bounded by the curve $y = \sin x$, $x = \dfrac{\pi}{2}$ and $x = \dfrac{3\pi}{2}$.

9. Find the area of the region by the curve $y = |x + 3|$,X axis and the lines $x = -6$ and x=0.

10. Find the area of the region bounded by the parabola $y = x^2 + 1$ and the lines $y = x, x = 0$ and x=2.

11. Find the area of the region bounded by the circles $x^2 + y^2 = 16$ and $(x + 4)^2 + y^2 = 16$

12. Find the area of the region bounded by parabola $f(x) = 4 - x^2$ and $g(x) = x^2 - 4$.

13. Using integration find the area of the region bounded by the triangle whose vertices are

$(-1, 1), (0, 5)$ and $(2, 3)$

14. Find the area of the region bounded by the curves $y = 5 - x^2$, X - axis and the lines x=2 and x=3.

15. Prove that the area of the region bounded by circle $x^2 + y^2 = 16$ and $y^2 = 6x$ is $\frac{4}{3}(4\pi + \sqrt{3})$ sq . Units

16. Find the area of the region bounded by the curves $y = (x - 1), (x - 2)$ and X - axis .

17. Find the area of the region bounded by the curves $y^2 = x + 1$ and $y^2 = -x + 1$

18. Find the area of the region bounded by circle $x^2 + y^2 = 8x$ and parabola $y^2 = 4x$.

19. 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 .

20. Find the area of the region enclosed by the curve $x^2 = 4y$ and line $x = 4y - 2$

21. Find the area of the region enclosed by $\{(x, y) : 0 \leq y \leq x^2 + 1, 0 \leq y \leq x + 1, 0 \leq x \leq 2\}$.

22. Find the area of the region bounded by the parbola $y^2 = x$ and line $x + y = 2$

23. Find the area of the region $\{(x, y) \mid x^2 \leq y \leq x\}.$

24. Using integration , find the area of triangular region formed by the lines $x + 2y = 2, y - x = 1$ and $2x + y = 7$

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

▶ Watch Video Solution

Exercise 8 1

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

▶ Watch Video Solution

2. Find the area of the region bounded by $y^2 = 9x$, $x = 2$, $x = 4$ and the X - axis in the first quadrant .

> ▶ **Watch Video Solution**

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

> ▶ **Watch Video Solution**

4. Find the area of the region bounded by the ellipse

$$\frac{x^2}{16} + \frac{y^2}{9} = 1.$$

▶ Watch Video Solution

5. Find the area of the region bounded by the ellipse

$$\frac{x^2}{4} + \frac{y^2}{9} = 1.$$

▶ Watch Video Solution

6. Find the area of the region in the first quadrant enclosed by X- axis , line $x = \sqrt{3}y$ and the circle

$x^2 + y^2 = 4.$

7. Find the area of the smaller part of the circle $x^2 + y^2 = a^2$ cut off by the line $x = \dfrac{a}{\sqrt{2}}$

8. The area between $x = y^2$ and $x = 4$ is divided into two equal by the line $x = a$ find the value of a.

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

10. Find the area bounded by the curve $x^2 = 4y$ and the line x = 4y - 2.

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

12. Area lying in the first quadrant and bounded by the circle $x^2 + y^2 = 4$ and the line $x = 0$ and $x = 2$ is

A. π

B. $\dfrac{\pi}{2}$

C. $\dfrac{\pi}{3}$

D. $\dfrac{\pi}{4}$

Answer: A

13. Area of the region bounded by the curve $y^2 = 4x,$ y-axis and the line y = 3 is

    A. 2

    B. $\dfrac{9}{4}$

    C. $\dfrac{9}{3}$

    D. $\dfrac{9}{2}$

Answer: B

▶ **Watch Video Solution**

Exercise 8 2

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

2. find the area bounded by the curve $(x - 1)^2 + y^2 = 1$ and $x^2 + y^2 = 1$.

3. Using integration find the area of the region bounded by the triangle whose vertices are

$(-1, 0), (1, 3)$ and $(3, 2)$

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

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

A. $2(\pi - 2)$

B. $\pi - 2$

C. $2\pi - 1$

D. $2(\pi + 2)$

Answer: B

> ▶ **Watch Video Solution**

6. Area lying between the curves $y^2 = 4x$ and y = 2x is

A. $\dfrac{2}{3}$

B. $\dfrac{1}{3}$

C. $\dfrac{1}{4}$

D. $\dfrac{3}{4}$

Answer: B

▶ **Watch Video Solution**

Miscellaneous Exercise 8

1. Find the area under the given curves and given lines :

$y = x^2, x = 1, x = 2$ and X -axis

▶ **Watch Video Solution**

2. Find the area under the given curves and given lines :

$y = x^2$, $x = 1$, $x = 2$ and X- axis

3. Find the area between the curves y = x and $y = x^2$

.

4. Find the area of the region lying in the first quadrant and bounded by $y = 4x^2$, $x = 0$, $y = 1$ and y=4.

5. Sketch the graph of $y = |x + 3|$ and evaluate $\int_{-6}^{0} |x + 3| dx$.

6. Find the area bounded by the curve $y = \sin x$ between $x = 0$ and $x = 2\pi$.

7. Find the area enclosed between the parabola $y^2 = 4ax$ and the line $y = mx$.

8. Find the area enclosed by the parabola $4y = 3x^2$ and the line $2y = 3x + 12$.

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

10. Find the area of the smaller region bounded by the ellipse $\dfrac{x^2}{a^2} + \dfrac{y^2}{b^2} = 1$ and the line $\dfrac{x}{a} + \dfrac{y}{b} = 1.$

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

12. Using the method of integration find the area bounded by the curve |x|+|y|= 1. [Hint: The required region is bounded by lines x + y = 1, x - y = 1, -x + y = 1 and -x -y =1].

13. Find the area bounded by curves $\{(x, y) : y \geq x^2 \text{and} y = |x|\}$.

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

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

16. Find the area of the regaion enclosed by $\{(x, y) : y^2 \leq 4x,\ 4x^2 + 4y^2 \leq 9\}$.

17. Area bounded by the curve $y = x^3$ the x-axis and the ordinates $x = -2$ and $x = 1$ is

    A. -9

    B. $-\dfrac{15}{4}$

    C. $\dfrac{15}{4}$

    D. $\dfrac{17}{4}$

Answer: D

▶ **Watch Video Solution**

18. The area bounded by the curve $y = x|x|$, X-axis and the ordinates $x = -1$ and x=1 is given by

A. 0

B. $\dfrac{1}{3}$

C. $\dfrac{2}{3}$

D. $\dfrac{4}{3}$

Answer: C

▶ **Watch Video Solution**

19. The area of the circle $x^2 + y^2 = 16$ exterior to the parabola $y^2 = 6x$ is .....

A. $\dfrac{4}{3}\left(4\pi - \sqrt{3}\right)$

B. $\dfrac{4}{3}\left(4\pi + \sqrt{3}\right)$

C. $\dfrac{4}{3}\left(8\pi - \sqrt{3}\right)$

D. $\dfrac{4}{3}\left(8\pi + \sqrt{3}\right)$

Answer: C

20. The area bounded by the Y-axis , $y = \cos x$ and $y = \sin x$ when $0 \le x \le \dfrac{\pi}{2}$ is

A. $2\left(\sqrt{2} - 1\right)$

B. $\sqrt{2} - 1$

C. $\sqrt{2} + 1$

D. $\sqrt{2}$

Answer: B

▶ **Watch Video Solution**

Textbook Illustrations For Practice Work

1. Find the area enclosed by the circle $x^2 + y^2 = a^2$.

2. Find the area enclosed by the circle the ellpise

$$\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$$

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

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. Find the area bounded by the ellipse $\dfrac{x^2}{a^2} + \dfrac{y^2}{b^2} = 1$ and the cordinates $x = 0$ and $x = ae$, where $b^2 = a^2(1 - e^2)$ and $e < 1$.

6. find the area of the region bounded by the two parabolas $y = x^2$ and $y^2 = x$

7. Find the area lying above x-axis and included between the circle $x^2 + y^2 = 8x$ and inside of the prarabola $y^2 = 4x$.

8. in figure $AOBA$ is the part of the ellipse $9x^2 + y^2 = 36$ in the first quadrant such that OA =2 and OB =6 . Find the area between the are AB and the chord AB.
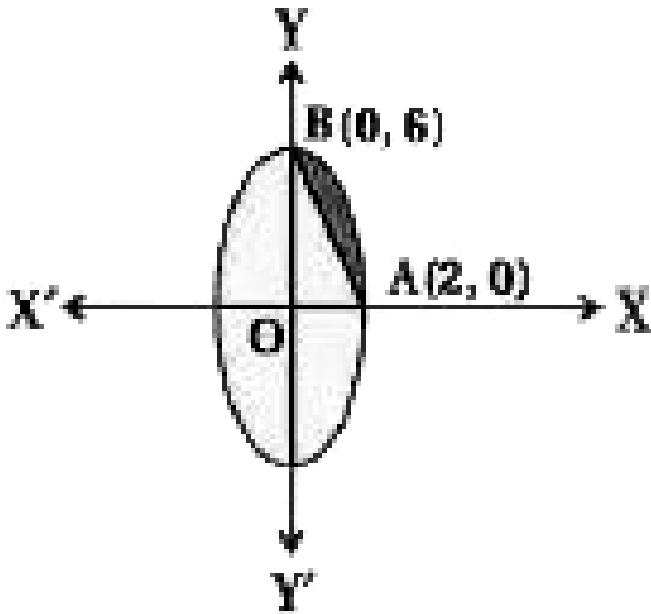
9. Using intregration find the area of region bounded by the triagnle whose vertices are $(1, 0), (2, 2)$ and $(3, 1)$

10. Find the area of the region enclosed between the two circles : $x^2 + y^2 = 4$ and $(x - 2)^2 + y^2 = 4$.

11. Find the area of the parabola $y^2 = 4ax$ bounded by its latus reactum ,

12. Find the area of the region bounded by the line $y = 3x + 2,$ the x -axis and the ordinates x=-1 and x=1.

13. Find the area bounded by the curve $y = \cos x$ between $x = 0$ and $x = 2\pi$.

14. 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.

15. Find the area of the region enclosed by $\{(x, y) : 0 \leq y \leq x^2 + 1, 0 \leq y \leq x + 1, 0 \leq x \leq 2\}$.

1. find the area of the region bounded by the curves $y^2 = 9x$ and $y = 3x$.

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

3. find the area of the region bounded by the curve $y = x^3$, $y = x + 6$ and $x = 0$

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

5. find the area of the region included between $y^2 = 9x$ and $y = x$.

6. find the area of the region enclosed by the parabola $x^2 = y$ and the line line $y = x + 2$.

7. Find the area of the region bounded by line $x = 2$ and parabola $y^2 = 8x$

> ▶ **Watch Video Solution**

8. Sketch the region $\left\{(x, 0) / y = \sqrt{4 - x^2}\right\}$ and X-axis . Find the area of the region using integration.

> ▶ **Watch Video Solution**

9. Calculate the area under the curve $y = 2\sqrt{x}$ included between the lines $x = 0$ and x=1

10. Using integration , find the area of the region bounded by the line $2y = 5x + 7$, $x$axis and the lines x=2 and x=8.

11. Draw a rough sketch of the curve $y = \sqrt{x - 1}$ in the interval $x \in [1, 5]$. Find the area under the curve and between the lines x=1 and x=5 .

12. Determine the area under the curve $y = \sqrt{a^2 - x^2}$ included between the lines x=0 and x=a .

13. find the area of the region bounded by $y = \sqrt{x}$ and y=x .

14. find the area enclosed by the curve $y = -x^2$ and the straight line $x + y + 2 = 0$

15. Find the area bounded by the curve $y = \sqrt{x}, x = 2y + 3$ in the first quadrant and Y-axis

Solutions Of Ncert Examplar Problems Long Answer Type Questions

1. Find the area of the region bounded by the curve $y^2 = 2x$ and $x^2 + y^2 = 4x$

2. Find the area bounded by the curve $y = \sin x$ between $x = 0$ and $x = 2\pi$.

3. Find the area of region bounded by the triangle whose vertices are A (-1,1) ,B (0,5) and C(3,2) using integration .

4. Draw a rough sketch of the region $\{(x, y)/y^2 \le 6ax$ and $x^2 + y^2 = 16a^2\}$ .Also find the area of the region sketched using method of integration .

5. Compute the area bounded by the lines $x + 2y = 2, y - x = 1$ and $2x + y = 7$

6. Find the area bounded by the lines $y = 4x + 5$, $y = 5 - x$ and $4y = x + 5$.

7. find the area bounded by the curve $y = 2\cos x$ and the X - axis from $x = 0$ to $x = 2\pi$

8. Draw a rough sketch of the given curve $y = 1 + |x + 1|$, $x = -3$, $x = 3$, $y = 0$ and find

the area of the region bounded by them , using

integration

Solutions Of Ncert Examplar Problems Objective Type Questions

1. The area bounded by the Y-axis

, $y = \cos x$ and $y = \sin x$ when $0 \le x \le \dfrac{\pi}{2}$ is

A. $\sqrt{2}$ seq, unit

B. $\sqrt{2} + 1$ seq. unit

C. $\sqrt{2} - 1$ seq unit

D. $2(\sqrt{2} - 1)$ seq. unit

Answer: C

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

A. $\dfrac{3}{8}$

B. $\dfrac{5}{8}$

C. $\dfrac{7}{8}$

D. $\dfrac{9}{8}$

Answer: D

3. The area of the region bounded by the curve $y = \sqrt{16 - x^2}$ and $X-$ axis is ....

A. 8π

B. 20π

C. 16π

D. 256π

Answer: A

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

    A. 16π

    B. 4π

    C. 32π

    D. 24π

Answer: B

5. Area of the region bounded by the curve $y = \cos x$ between x=0 and x=π is ....

A. 2

B. 4

C. 3

D. 1

Answer: A

6. The area of the region bounded by parabola $y^2 = x$ and the straight line $2y = x$ is.......... Seq. unit

A. $\dfrac{4}{3}$

B. 1

C. $\dfrac{2}{3}$

D. $\dfrac{1}{3}$

Answer: A

▶ **Watch Video Solution**

7. The area of the region bounded by the curve $y = \sin x$ between the ordinates $x = 0, x = \dfrac{\pi}{2}$ and the X- axis is .... Seq . Unit

A. 2

B. 4

C. 3

D. 1

Answer: D

▶ Watch Video Solution

8. The area of the region bounded by the ellipse $\dfrac{x^2}{25} + \dfrac{y^2}{16} = 1$ is .....

A. 20π

B. $20\pi^2$

C. $16\pi^2$

D. 25π

Answer: A

9. The area of the region bounded by the circle $x^2 + y^2 = 1$ is .... seq , unit.

A. 2π

B. π

C. 3π

D. 4π

Answer: B

▶ **Watch Video Solution**

10. The area of the region bounded by the curve $y = x + 1$ and the lines $x = 2$ and x=3 is ....

A. $\dfrac{7}{2}$

B. $\dfrac{9}{2}$

C. $\dfrac{11}{2}$

D. $\dfrac{13}{2}$

Answer: A

▶ **Watch Video Solution**

11. The area of the region bounded by the curve $x = 2y + 3$ and the lines $y = 1$ and y=-1 is ....

A. 4

B. $\dfrac{3}{2}$

C. 6

D. 8

Answer: C

▶ **Watch Video Solution**

1. The area of the region bounded by the curve $y = \log_e(x + e)$ and axis is .... Sq . Units

A. 1

B. 2

C. 3

D. 4

Answer: A

▶ **Watch Video Solution**

2. The function f(x) is passing through (1,2) and its slope is (2x +1) . The area of the region bounded by the function and x-axis is .....Sq units

A. 6

B. $\dfrac{5}{6}$

C. $\dfrac{1}{6}$

D. None of these

Answer: C

▶ Watch Video Solution

3. The area of the region bounded by the curve y=sin

x ,x =0 and x=2π is .....sq. units

    A. 2

    B. 4

    C. 8

    D. 1

Answer: B

▶ **Watch Video Solution**

4. The area of the region bounded by the curve $y = \log_e x$, $x = 0$ and $y \leq 0$ and X- axis is ...sq. unit

A. 1

B. $\dfrac{1}{2}$

C. 2

D. None of these

Answer: A

5. The area of the region bounded by the curve $y = 2x - x^2$ and X -axis is ..... Sq . Units .

A. $\dfrac{3}{5}$

B. 2

C. 8

D. $\dfrac{4}{3}$

Answer: D

▶ **Watch Video Solution**

6. The area of the region bounded by the curve $y = \cos x$, $-\dfrac{\pi}{2} \le x \le \dfrac{\pi}{2}$ and X - axis is ...sq .unit

A. 1

B. 4

C. 2

D. π

Answer: C

▶ **Watch Video Solution**

7. The area of the region bounded by the curve $y = \sin x, \pi \leq x \leq 2\pi$ and X -axis is ....sq . Units.

A. π

B. 2

C. -2

D. 0

Answer: B

▶ Watch Video Solution

8. The area between the curve $y = x^2$, X- axis and x=4 is divided into two equal parts by the line x=a . The value of a is

A. 2

B. $2^{\frac{4}{3}}$

C. $2^{\frac{5}{3}}$

D. 4

Answer: C

▶ **Watch Video Solution**

9. The area of the region bounded by the parabola $y^2 = 4ax$ and its latus rectum is ...Sq. units.

A. $\dfrac{4}{3}a^2$

B. $\dfrac{8}{3}a^2$

C. $\dfrac{16}{3}a^2$

D. $\dfrac{32}{3}a^2$

Answer: B

▶ **Watch Video Solution**

10. The area of the region bounded by the curve $y = 2x^2$, X -axis and the line x=1 is ....Sq . Units .

A. 2

B. 1

C. $\dfrac{1}{3}$

D. $\dfrac{2}{3}$

Answer: D

▶ **Watch Video Solution**

11. The area bounded by the curve $y = x|x|$, X-axis and the ordinates $x = -1$ and x=1 is given by

A. 0

B. $\dfrac{1}{3}$

C. $\dfrac{2}{3}$

D. $\dfrac{4}{3}$

Answer: C

▶ **Watch Video Solution**

12. The area of the region bounded by the line $y = 3 - x$ and X-axis and in the interval [0,3] is .....Sq. units.

A. $\dfrac{9}{2}$

B. 4

C. 5

D. $\dfrac{11}{2}$

Answer: A

▶ **Watch Video Solution**

13. The area of the region by the curve $y = 3\cos x, 0 \leq x \leq \dfrac{\pi}{2}$ is ..Sq. Units.

A. 3

B. 1

C. $\dfrac{3}{2}$

D. $\dfrac{1}{2}$

Answer: A

▶ Watch Video Solution

14. The area of the region bounded by the curve $y = 2\sqrt{x}$ and lines $x = 0$ and x=1 is ...Sq. units

A. $\dfrac{1}{3}$

B. $\dfrac{2}{3}$

C. 1

D. $\dfrac{4}{3}$

Answer: D

▶ **Watch Video Solution**

15. The area of the region bounded by the curve $y = |x - 5|$, X- axis and the lines $x = 0, x = 1$ is

.....Sq . Units.

A. $\dfrac{9}{2}$

B. $\dfrac{7}{2}$

C. 9

D. 5

Answer: A

▶ **Watch Video Solution**

16. The area of the region bounded by the curve $y^2 = 4x$ and the line $x = 3$ is ....Sq . Units

A. $4\sqrt{3}$

B. $8\sqrt{3}$

C. $16\sqrt{3}$

D. $5\sqrt{3}$

Answer: B

▶ Watch Video Solution

17. The area of the region bounded by the circle $x^2 + y^2 = 4$ and the lines $x = 0$ and x=2 in the first quadrant is ...Sq. units.

  A. π

  B. $\dfrac{\pi}{2}$

  C. $\dfrac{\pi}{3}$

  D. $\dfrac{\pi}{4}$

Answer: A

▶ **View Text Solution**

18. The Area of the region bounded by the curve $y^2 = 2x$, y-axis and line y=3 is .....Sq. units

    A. 2

    B. $\dfrac{9}{4}$

    C. $\dfrac{9}{3}$

    D. $\dfrac{9}{2}$

Answer: D

▶ **Watch Video Solution**

19. The area of the region bounded by the curve $y = x^2$ and line $x = 1, x = 3$ and appear part of X-axis is ...Sq. units .

A. $\dfrac{19}{3}$

B. $\dfrac{26}{3}$

C. $\dfrac{16}{3}$

D. 9

Answer: B

▶ **Watch Video Solution**

20. The area of the region bounded by the curve $y = 2\sin x$, $X - $ axis and $0 \le x \le \pi$ is ......Sq. units.

A. 4

B. 6

C. 1

D. 2

Answer: A

▶ **Watch Video Solution**

21. The area of the region enclosed by the line $y = x + 1$, X-axis and the lines $x = -3$ and $x = +3$ is .... Sq . Units.

A. 5

B. 7

C. 10

D. 9

Answer: C

▶ Watch Video Solution

22. The area of the region bounded by the semicircle $y = \sqrt{4 - x^2}$ and X - axis is ..Sq . Units .

A. 2π

B. π

C. $\dfrac{\pi}{2}$

D. 4π

Answer: A

▶ **Watch Video Solution**

23. the area of the region bounded by the parabola $y = x^2$ and the line $y = 4$ is ....Sq . Units.

A. $\dfrac{32}{3}$

B. $\dfrac{16}{3}$

C. $\dfrac{8}{3}$

D. $\dfrac{64}{3}$

Answer: A

▶ **Watch Video Solution**

24. The area of the region bounded by the curve $y = |x - 5|$, X-axis and the line $x = 5, x = 6$ is

...........Sq . Units.

A. 1.25

B. 0.25

C. 0.50

D. 0.75

Answer: C

25. The area of the region bounded by the curve $y = \cos x, \quad -\dfrac{\pi}{2} \leq x \leq \dfrac{\pi}{2}$ and X - axis is ...sq .unit

A. 2

B. 1

C. $\dfrac{3}{2}$

D. $\dfrac{1}{2}$

Answer: A

▶ **Watch Video Solution**

26. The area of the region bounded by the curve $y = x^2 - x - 6$ and X- axis is ....Sq. units.

A. $\dfrac{5}{6}$

B. $\dfrac{25}{6}$

C. $\dfrac{125}{6}$

D. $\dfrac{50}{6}$

Answer: C

▶ Watch Video Solution

27. The area of the curve enclosed by the curve $y = 5\sin x \,, 0 < x < \dfrac{\pi}{2}$, x -axis is ......sq.units.

A. 1

B. $\dfrac{5}{2}$

C. $\dfrac{1}{5}$

D. 5

Answer: D

28. The area of the curve enclosed by the curve $y^2 = 2x$, Y -axis and line $y = 2$ is ....Sq . Units .

A. $\dfrac{4}{3}$

B. $\dfrac{9}{2}$

C. 8

D. $\dfrac{8}{3}$

Answer: A

▶ **Watch Video Solution**

29. The area of the curve bounded by the curve f(x) = sin πx and X - axis is ......sq. units . $x \in [1, 3]$

A. $\dfrac{3}{\pi}$

B. $\dfrac{2}{\pi}$

C. $\dfrac{4}{\pi}$

D. $\dfrac{1}{\pi}$

Answer: B

> ▶ **Watch Video Solution**

30. The area of the region bounded by the curve $y = x^2 - x - 6$, $y = 0$, $x = -1$ and x=1 ` is ....Sq. units.

A. $\dfrac{37}{3}$

B. $\dfrac{37}{6}$

C. $\dfrac{34}{3}$

D. $\dfrac{125}{6}$

Answer: C

▶ **Watch Video Solution**

31. The area of the region bounded by the parabola $y^2 = 4ax$ and its latus retrurn is 24 Sq. units . Then a =............ .

A. $\pm \dfrac{3}{2}$

B. ± 3

C. ± 6

D. 9

Answer: B

32. For an ellipse $\dfrac{x^2}{a^2} + \dfrac{y^2}{b^2} = 1, a > b$, the area enclosed by two latus rectum is .... (where is the eccentricity of an ellipse)

A. $b\left(be + a\sin^{-1}2e\right)$

B. $8b\left(be + a\sin^{-1}e\right)$

C. $\left(2b\left(be + a\sin^{-1}e\right)\right)$

D. $4b\left(be + a\sin^{-1}e\right)$

Answer: C

▶ Watch Video Solution

33. The area of the region bounded by the curve $y = |x - 1|$ and $y = 3 - |X|$ is ....Sq. units

A. 6

B. 2

C. 3

D. 4

Answer: D

▶ **Watch Video Solution**

34. Find the area enclosed by the parabola $(y - 2)^2 = x - 1$, x -axis and the tangent to the parabola at $(2, 3)$ points is ....Sq. units

A. 9

B. 12

C. 3

D. 6

Answer: A

> ▶ **Watch Video Solution**

35. The area of the region enclosed between the curves

$y = \sin x + \cos x$ and $y = |\cos x - \sin x|$, $x \in \left[0, \dfrac{\pi}{2}\right]$

is ....Sq. units.

A. $4\sqrt{2} - 1$

B. $2\sqrt{2}(\sqrt{2} - 1)$

C. $2(\sqrt{2} + 1)$

D. $\sqrt{2} + 1$

Answer: B

▶ **Watch Video Solution**

36. The area of the region bounded by the curves $y = x^2$ and $y = \sqrt{|x|}$ is .....Sq.units.

A. $\dfrac{1}{3}$

B. $\dfrac{2}{3}$

C. $\dfrac{1}{6}$

D. 1

Answer: B

▶ **Watch Video Solution**

37. The tangent at a point (1,1) to the curve $f(x) = x^2 + bx - b$ makes a trinagle in the first quadrant with axes . If the area of this triangle is 2 Sq, units then the value of b is ......

   A. -1

   B. -2

   C. -3

   D. 1

Answer: C

38. The area of the region enclosed by the curves $y = \sin x, y = \cos$ and $x = 0, x = \dfrac{3\pi}{2}$ is ......Sq. units.

A. $4\sqrt{2} - 2$

B. $4\sqrt{2} + 2$

C. $4\sqrt{2} - 1$

D. $4\sqrt{2} + 1$

Answer: A

▶ **Watch Video Solution**

39. The area of the region enclosed by the curve $y = \log_e x$ and $y = (\log_e x)^2$ is ....Sq. units

A. $e + 1$

B. $e - 1$

C. $3 - e$

D. 1

Answer: C

▶ **Watch Video Solution**

40. The area of the region bounded by the curve $(y - x)^2 = x^3$ and the line $x = 1$ is ....Sq. unit.

A. $\dfrac{3}{5}$

B. $\dfrac{4}{5}$

C. $\dfrac{2}{5}$

D. $\dfrac{1}{5}$

Answer: B

▶ Watch Video Solution

41. The area of the region bounded by the curve $y = \left[\dfrac{x^2}{64} + 2 \right]$ and the lines $y = x - 1$, $x = 0$ and above the X-axis is ..... Sq. units where [.] denotes maximum integer function .

A. 2

B. 3

C. 4

D. None of these

Answer: C

42. The area of smallest region enclosed by the circle $x^2 + y^2 = 9$ and the line $x = 1$ is .....Sq. units

A. $\dfrac{1}{2}\left(9\sec^{-1}3 - \sqrt{8}\right)$

B. $9\sec^{-1}(3) - \sqrt{8}$

C. $\sqrt{8} - 9\sec^{-1}3$

D. None of these

Answer: B

▶ **Watch Video Solution**

43. The curve $y = a\sqrt{x} + bx$ is passing through (1,2) the area of the region bounded by the curve line $x = 4$ and X - axis is 8 Sq. units then

    A. a=3 b=-1

    B. a=3 b=1

    C. a=-3 b=1

    D. a=-3 b=-1

Answer: A

44. The area of the region bounded bwtween the curve $y = 2^x$ and $y = 2x - x^2$ and the lines x=0 , x=2 is ....Sq. units

A. $\dfrac{4}{3} - \dfrac{1}{\log 2}$

B. $\dfrac{3}{\log 2} + \dfrac{4}{3}$

C. $\dfrac{4}{\log 2} - 1$

D. $\dfrac{3}{\log 2} - \dfrac{4}{3}$

Answer: D

▶ **Watch Video Solution**

45. The ratio of the area of the region of the curves $y = \cos x$ and $y = \cos 2x$ between X- axis ,$x = 0$ to $x = \dfrac{\pi}{3}$ is ....

A. $1 : 2$

B. $2 : 1$

C. $\sqrt{3} : 1$

D. $1 : \sqrt{3}$

Answer: B

46. The area of the region bounded by the curve $y = |[x-3]|$, X - axis and the lines x=-2 and x =3 is ...... q. units.

where [.] denotes maximum integer function .

A. 7

B. 15

C. 4

D. 28

Answer: B

▶ **Watch Video Solution**

47. The area of the region bounded by the curve $y = x^2 + 2x + 1$, Y- axis and the tangent drawn at a point (1,4) to the curve is .... Sq . Units

A. $\dfrac{2}{3}$

B. $\dfrac{1}{3}$

C. 2

D. None of these

Answer: B

▶ Watch Video Solution

48. $f(x) = \begin{cases} x^2 & ,x \leq 0 \\ x & ,x \geq 0 \end{cases}$ the area of the region bounded by the curve $y = f(x), y = 0$ and $x = \pm 3a$ is $\dfrac{9a}{2}$ sq . Units then a =...........

A. $\dfrac{1}{2}$

B. $-\dfrac{1}{2}$

C. 0

D. -1

Answer: A

▶ **Watch Video Solution**

49. $f(x) = \max\left\{\sin x, \cos x, \dfrac{1}{2}\right\}$ the area of the region bounded by the curve $y = f(x)$, X-axis Y-axis and x=2π is ....Sq. units

A. $\left(\dfrac{5\pi}{12} + 3\right)$

B. $\left(\dfrac{5\pi}{12} + \sqrt{2}\right)$

C. $\left(\dfrac{5\pi}{12} + \sqrt{3}\right)$

D. $\left(\dfrac{5\pi}{12} + \sqrt{2} + \sqrt{3}\right)$

Answer: D

▶ Watch Video Solution

50. $f(x) = x^2 - 3x + 2 \, \forall x \in R$

the area of the region bounded by the curve y=f(x) ,

X-axis and Y-axis is ....sq units.

A. $\dfrac{1}{3}$

B. $\dfrac{2}{3}$

C. $\dfrac{3}{5}$

D. $\dfrac{5}{6}$

Answer: D

▶ **Watch Video Solution**

51. The area of the region enclosed by the curve $y = f(|x|)$, x - axis is ....Sq. units

A. 1

B. 2

C. 3

D. 0

Answer: D

▶ View Text Solution

52. The area of the reagion bounded by the curve $y = |f(|X|)|$, X- axis and $1 \leq |x| \leq 2$ is ....Sq. units

A. $\dfrac{1}{5}$

B. $\dfrac{1}{4}$

C. $\dfrac{1}{3}$

D. $\dfrac{1}{2}$

Answer: C

▶ View Text Solution

53. $|f(|x|) = a|$ has six real roots then ...

A. $a \in \left(0, \dfrac{1}{4}\right)$

B. $a \in \left(\dfrac{1}{4}, 2\right)$

C. $a \in \left(-\dfrac{1}{4}, 0\right)$

D. None of these

Answer: D

> ▶ **View Text Solution**

54. The number of solution of

$|y| = |f(|x|)|$ and $x^2 + y^2 = 2$ is ....

A. 4

B. 6

C. 8

D. 5

Answer: C

▶ **View Text Solution**

---

55. The area of the region bounded by the curve $y = x^4 - 2x^3 + x^2 + 3$, X - axis and the x-co-ordination of the point where y becomes minimum is .....Sq. units

A. 1

B. $\dfrac{91}{30}$

C. $\dfrac{30}{9}$

D. 4

Answer: B

▶ **Watch Video Solution**

56. The area of the region enclosed by $\{(x, y) : x^2 + y^2 \le 1 \le x + y\}$ is .....Sq. units

A. $\dfrac{\pi}{5}$

B. $\dfrac{\pi}{4}$

C. $\dfrac{\pi}{4} - \dfrac{1}{4}$

D. $\dfrac{\pi^2}{2}$

Answer: C

▶ **Watch Video Solution**

---

57. The area of the region bounded by the parabola $y = x^2 + 1$ and the line $x + y = 3$ is ....sq. units .

A. $\dfrac{45}{7}$

B. $\dfrac{25}{4}$

C. $\dfrac{\pi}{18}$

D. $\dfrac{9}{2}$

Answer: D

▶ **Watch Video Solution**

58. The area of the region bounded by the lines $y = 1 - |x|$ and X-axis is ....Sq. units

A. 1

B. 2

C. 3

D. 4

Answer: A

Answer: A

⊙ Watch Video Solution

59. The area of the region bounded by the curve $x = \cos^{-1} y$ and X- axis and the lines $|x| = 1$ is

..........sq.units

    A. $2\sin 1^\circ$

    B. 0

    C. $\dfrac{\pi}{2}$

D. None of these

Answer: A

> ▶ **Watch Video Solution**

---

60. The area of the region bounded by the curve $y = e^x$, $x = a$ and x=b and X- axis is .....Sq. units $(a < b)$

A. e^{a-b}

B. e^{b-a}

C. $e^a - e^b$

D. $e^b - e^a$

Answer: D

61. The area of the region bounded by the curve $y = \tan\theta$, $x = 0$ and $x = \dfrac{\pi}{4}$ is ....Sq. units .

A. log 2

B. 2 log 2

C. $\dfrac{1}{2}$ log 2

D. $\log 3$

Answer: C

62. The area of the region bounded by the curve $y^2 = 4ax$ and $y = mx$ is $\dfrac{a^2}{3}$ Sq. units then the value of m is..............

A. 2

B. -2

C. $\dfrac{1}{2}$

D. 1

Answer: A

63. If the area of the region bounded by the curve $y = f(x)$, X - axis and x=1 and x=b is (b-1) sin (3b+4) ` f(x) ......

A. $3(x - 1)\cos(3x + 4) + \sin(3x + 4)$

B. $(b - 1)\sin(3x + 4) + 3\cos(3x + 4)$

C. $(b - 1)\cos(3x + 4) + 3\sin(3x + 4)$

D. None of these

Answer: A

64. The area of region bounded by the curve $y = |x - 1|$ and $y = 1$ is ...Sq. units

A. 2

B. 1

C. $\dfrac{1}{2}$

D. None of these

Answer: B

65. The area between the parabolas $y^2 = 4ax$ and $x^2 = 8ay$ is ...... Sq. units .

A. $\dfrac{8}{3}a^2$

B. $\dfrac{4}{3}a^2$

C. $\dfrac{32}{3}a^2$

D. $\dfrac{16}{3}a^2$

Answer: C

66. The area between the parabolas $y^2 = 4x$ and $x^2 = 4y$ divide the square formed by the lines $x = 4$, y=4 and oxes into three parts . If the area of these three parts from uppar to bottom is S_1, s_2 and S_3 then $S_1 : S_2 : s_3$=...........

   A. $2:1:2$

   B. $1:1:1$

   C. $1:2:1$

   D. $1:2:3$

Answer: B

> ▶ Watch Video Solution

67. The area of the region bounded by the curve $y = \sqrt{3x + 4}$, x - axis and $x = -1$ and $x = 4$ is A. the area of the region bounded by the curve $y^2 = 3x + 4$, X - axis and x=-1 and x=4 is B. then A : B =........

A. $1 : 1$

B. $2 : 1$

C. $1 : 2$

D. None of these

Answer: A

68. The function $f(x)$ is a non - negative continous function .The area of the region bounded by the curve $y = f(x)$, X - axis , $x = \dfrac{\pi}{4}$, $x = \beta > \dfrac{\pi}{4}$ is $\beta \sin \beta + \dfrac{\pi}{4} \cos \beta + \sqrt{2}\beta$ then $f\left(\dfrac{\pi}{2}\right)$ ......

A. $\left(1 - \dfrac{\pi}{4} - \sqrt{2}\right)$

B. $\left(1 - \dfrac{\pi}{4} + \sqrt{2}\right)$

C. $\dfrac{\pi}{4} + \sqrt{2} - 1$

D. $\dfrac{\pi}{4} - \sqrt{2} + 1$

Answer: B

69. The area of region bounded by the curve $x^2 + y^2 = 9$ parabola $y^2 = 8x$ is ......

A. 0

B. $\dfrac{2\sqrt{2}}{3} + \dfrac{9\pi}{2} - 9\sin^{-1}\left(\dfrac{1}{3}\right)$

C. 16π

D. None of these

Answer: B

70. The area of region bounded by the curve $y = x - x^2$ and line $y = mx$ is $\dfrac{9}{2}$ then the value of m is ....

A. -4

B. -2

C. 2

D. 4

Answer: B

Watch Video Solution

71. The area of the region bounded by the curve $y = \log x$, $y = \log|x|$, $y = |\log x|$ and $y = |\log|x||$ is ....Sq. units

A. 4

B. 6

C. 10

D. None of these

Answer: A

72. The area of the quadrilateral formed by the tangents drawn at extreme points of latus reactum of an ellipse $\dfrac{x^2}{9} + \dfrac{y^2}{5} = 1$ is ...Sq. units .

A. $\dfrac{27}{4}$

B. 9

C. $\dfrac{27}{2}$

D. 27

Answer: D

73. The area of the region bounded bwtween the curve $y = 2^x$ and $y = 2x - x^2$ and the lines x=0 , x=2 is ....Sq. units

A. $\dfrac{4}{3} - \dfrac{1}{\log 2}$

B. $\dfrac{3}{\log 2} + \dfrac{4}{3}$

C. $\dfrac{4}{\log 2} - 1$

D. $\dfrac{3}{\log 2} - \dfrac{4}{3}$

Answer: D

▶ Watch Video Solution

74. $f(x) = \min\left\{x + 1, \sqrt{(1 - x)}\right\}$ the area of the region bounded by the curve f(x) and X - axis is

....Sq. unit

A. $\dfrac{1}{6}$

B. $\dfrac{5}{6}$

C. $\dfrac{7}{6}$

D. $\dfrac{11}{6}$

Answer: C

> ▶ Watch Video Solution

75. The area of the region bounded by the curves $y = 2 - |2 - x|$ and $y = \dfrac{3}{|x|}$ is ......sq. units .

A. $\dfrac{5 - 4 \log 2}{3}$

B. $\dfrac{2 - \log 3}{2}$

C. $\dfrac{4 - 3 \log 3}{2}$

D. None of these

Answer: C

▶ **Watch Video Solution**

76. The area of the region bounded by the curves $y = xe^x$, $y = xe^{-x}$ and the line $x = 1$ is ....Sq. unit.

   A. $2e$

   B. $\dfrac{2}{e}$

   C. $\dfrac{e}{2}$

   D. e^2

Answer: B

77. The area of the region bounded by the curve $(y - x)^2 = x^3$ and the line $x = 1$ is ....Sq. unit.

A. $\dfrac{1}{3}$

B. $\dfrac{4}{5}$

C. $\dfrac{6}{4}$

D. 3

Answer: B

▶ Watch Video Solution

78. The area of the region enclosed by the curves $|x + y - 1| + |2x + y - 1| = 1$ is .....Sq. unit.

A. 2

B. 3

C. 6

D. 7

Answer: A

▶ **View Text Solution**

79. The area of the region bounded by the curve $y = \cos x$, $y = \sin x$, Y-axis and $0 \le x \le \dfrac{\pi}{4}$ is .... Sq. units.

A. $2\left(\sqrt{2} - 1\right)$

B. $\sqrt{2} - 1$

C. $\sqrt{2} + 1$

D. $\sqrt{2}$

Answer: B

▶ **Watch Video Solution**

80. The area of the region enclosed by the curve $y = |\sin x|$ X- axis and the lines $|x| = \pi$ is ....Sq. units.

A. 4

B. 3

C. 2

D. 1

Answer: A

▶ **Watch Video Solution**

81. The area of the region bounded by the lines $y = |x|$, X- axis and |x| =1 is ....Sq. units.

A. 3

B. 2

C. 1

D. 4

Answer: C

82. The area of the reagion bounded by the curve $y = [x]$ and the lines $x = 1$ and $x = 1.9$ is .... Sq . Units . Where [.] denotes the greatest integer function .

A. $\dfrac{3}{5}$

B. $\dfrac{7}{10}$

C. $\dfrac{4}{5}$

D. $\dfrac{9}{10}$

Answer: D

▶ **Watch Video Solution**

83. If $A = \{(x, y), x^2 + y^2 \leq 1 \text{ and } y^2 \leq 1 - x\}$

then the area of A is .....Sq. units .

A. $\dfrac{\pi}{2} - \dfrac{2}{3}$

B. $\dfrac{\pi}{2} + \dfrac{2}{3}$

C. $\dfrac{\pi}{2} + \dfrac{4}{3}$

D. $\dfrac{\Pi}{2} - \dfrac{4}{3}$

Answer: C

84. The area of the region bounded by $\{(x, y): y^2 \geq 2x \text{ and } x^2 + y^2 \leq 4x, x \geq 0, y \geq 0\}$ is ....Sq. units.

A. $\pi - \dfrac{4}{3}$

B. $\pi - \dfrac{8}{3}$

C. $\pi - \dfrac{4\sqrt{2}}{3}$

D. $\dfrac{\pi}{2} - \dfrac{2\sqrt{2}}{3}$

Answer: B

85. The area of region bounded by $\{(x, y) : x \geq 0, x + y \leq 3, x^2 \leq 4y$ and $y \leq 1 + \sqrt{x}\}$ is ....Sq . Units

A. $\dfrac{5}{2}$

B. $\dfrac{59}{12}$

C. $\dfrac{3}{2}$

D. $\dfrac{7}{3}$

Answer: A

86. Area bounded by curve $y = \tan \pi x, x \in \left[-\frac{1}{4}, \frac{1}{4} \right]$ and X-axis is .....

A. $\dfrac{\log 2}{2\pi}$

B. $\dfrac{\log 2}{2}$

C. $\log 2$

D. $\dfrac{\log 2}{\pi}$

Answer: D

▶ Watch Video Solution

87. If the area of the region bounded by two curves $y = x^2$ and $y = x^3$ is $\dfrac{k}{6}$ then k=.......

A. $\dfrac{1}{3}$

B. $\dfrac{1}{12}$

C. $\dfrac{1}{2}$

D. $\dfrac{1}{4}$

Answer: C

> ▶ Watch Video Solution

88. Area bounded by the ellipse $\dfrac{x^2}{4} + \dfrac{y^2}{16} = 4$ is ....

A. 64π

B. 32π

C. 8π

D. $\dfrac{\pi}{64}$ s

Answer: B

89.   Let

$x^k + y^k = a^k (a, k > 0)$ and $\dfrac{dy}{dx} + \left(\dfrac{y}{x}\right)^{\frac{1}{3}} = 0$

then k is ....

A. $\dfrac{1}{3}$

B. $\dfrac{3}{2}$

C. $\dfrac{2}{3}$

D. $\dfrac{4}{3}$

Answer: C

▶ **Watch Video Solution**

90. Let the function $f: [-7, 9] \to R$ be continuous on $[-7, 0]$ and differential on $(-7, 0)$. If $f(-7) = -3$ and $f'(x) \le 2$, for all $x \in (-7, 0)$

, then for all such function f, $f(-1) + f(0)$ lies in the interval :

A. $[-6, 20]$

B. $[-\infty, 20]$

C. $[-\infty, 11]$

D. $[-3, 11]$

Answer: B

> ▶ Watch Video Solution

---

91. The area (in Sq. units) of the region $\{(x, y) \in R \mid 4x^2 \leq y \leq 8x + 12\}$ is :

A. $\dfrac{125}{3}$

B. $\dfrac{128}{3}$

C. $\dfrac{124}{3}$

D. $\dfrac{127}{3}$

Answer: B

▶ **Watch Video Solution**

Practice Paper Section A

1. The area of the region bounded by the curve $y = 2x - x^2$ and X -axis is ..... Sq . Units .

A. $\dfrac{3}{5}$

B. 2

C. 8

D. $\dfrac{4}{3}$

Answer:

▶ **Watch Video Solution**

---

2. The area of the region by the curve $y = 3\cos x, 0 \le x \le \dfrac{\pi}{2}$ is ..Sq. Units.

A. 3

B. 1

C. $\dfrac{3}{2}$

D. $\dfrac{1}{2}$

Answer:

3. The area of the region bounded by the line

$x + 2y = 8$,X-axis and the lines x=2 and x=4 is

..........sq . Units

A. 12

B. 5

C. 10

D. 8

Answer:

4. The area of the region bounded by the curve $y = e^x$, $x = a$ and x=b and X- axis is …..Sq. units $(a < b)$

A. $e^a - e^b$

B. $e^b - e^a$

C. e^{-b-a}

D. e^{a-b}

Answer:

5. The area of the region bounded by the curve $y = |x - 5|$, X- axis and the lines $x = 0, x = 1$ is

.....Sq . Units.

A. $\dfrac{9}{2}$

B. $\dfrac{7}{2}$

C. 9

D. 5

Answer:

6. The area of the region bounded by the curve $y = \sqrt{3x + 4}$, x - axis and $x = -1$ and $x = 4$ is A. the area of the region bounded by the curve $y^2 = 3x + 4$, X - axis and x=-1 and x=4 is B. then A : B =........

A. $1:1$

B. $2:1$

C. $1:2$

D. None of these

Answer:

▶ **Watch Video Solution**

Practice Paper Section B

1. Using integration , find the ara of the region bounded by the circle $x^2 + y^2 = a^2$

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

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

Practice Paper Section C

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

2. find the area bounded by the curve $(x-1)^2 + y^2 = 1$ and $x^2 + y^2 = 1$.

3. Find the area of the region bounded by the curves $y = \sqrt{4 - x^2}, y = \sqrt{3x}$ and X- Axis in the first quadrant .

> ▶ **Watch Video Solution**

4. Find the area of the region enclosed by the lines $y = |x - 1|, y = 0$ and $|X| = 2$.

> ▶ **Watch Video Solution**

Practice Paper Section D

1. Find the area of the regaion enclosed by

$$\{(x, y) : y^2 \leq 4x,\ 4x^2 + 4y^2 \leq 9\}.$$

▶ Watch Video Solution

2. Find the area of the region enclosed by

$$\{(x, y) : 0 \leq y \leq x^2 + 1,\ 0 \leq y \leq x + 1,\ 0 \leq x \leq 2\}.$$

▶ Watch Video Solution