MATHS

BOOKS - NCERT MATHS (ENGLISH)

APPLICATION OF INTEGRALS

Short Answer Type Qestions

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

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

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

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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 y = x+ 2.

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

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

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 line x = 2 and x = 8.

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

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

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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 X-axis.

16. Find the area of the region bounded by the curve $y^2 = 9x$ and $y = 3x$.

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

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

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

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

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

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

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

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

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

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

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

28. Find the area if the region bounded by $y = \sqrt{x}$ and $y = x$.

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

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

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

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

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

4. Find the area of the region $\{(x, y): y^2 = 6ax \text{ and } x^2 + y^2 = 16a^2\}$ 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.

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

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

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

12. Find the area of the region

$$\{(x, y) : y^2 = 6ax \text{ and } x^2 + y^2 = 16a^2\}$$

using method of integration .

13. Compute the area bounded by the lines

$x + 2y = 2, \ y - x = 1$ and $2x + y = 7$.

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

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

16. 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.

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Objective Type Questions

1. The area of the region bounded by the $Y - \text{axis}$ $y = \cos x$ and $y = \sin x$ Where

$0 \leq x \leq \dfrac{\pi}{2}$, is

A. $\sqrt{2}$ sq units

B. $\left(\sqrt{2}+1\right)$ sq units

C. $\left(\sqrt{2}-1\right)$ sq units

D. $\left(2\sqrt{2}-1\right)$ sq units

Answer: C

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

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

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

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

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

Answer: D

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

A. 8π sq units

B. 20π sq units

C. 16π sq units

D. 256π sq units

Answer: A

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

    A. 16π sq units

    B. 4π sq units

    C. 32π sq units

    D. 24π sq units

Answer: B

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5. Area of the regionbounded by the curve $y = \cos x$ between $x = 0$ and $x = \pi$ is

    A. 2 sq units

    B. 4 sq units

    C. 3 sq units

    D. 1 sq unit

Answer: A

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

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

B. 1 sq unit

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

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

Answer: A

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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

A. 2 sq units

B. 4 sq units

C. 3 sq units

D. 1 sq unit

Answer: D

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

A. 20π sq units

B. $20\pi^2$ sq units

C. $16\pi^2$ sq units

D. 25π sq units

Answer: A

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

    A. 2π sq units

    B. π sq units

    C. $3\pi^2$ sq units

    D. 4π sq units

Answer: B

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

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

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

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

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

Answer:

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

    A. 4 sq units

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

    C. 6 sq units

    D. 8 sq unit

Answer: C

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12. The area of the region bounded by the $Y-$ axis $y = \cos x$ and $y = \sin x$ Where $0 \leq x \leq \dfrac{\pi}{2}$, is

A. $\sqrt{2}$ sq units

B. $\left(\sqrt{2} + 1\right)$ sq units

C. $\left(\sqrt{2} - 1\right)$ sq units

D. $\left(2\sqrt{2} - 1\right)$ sq units

Answer: C

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

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

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

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

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

Answer: D

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

A. 8π sq units

B. 20π sq units

C. 16π sq units

D. 256π sq units

Answer: A

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15. Area of the region in the first quadrant exclosed by the X-axis, the line y=x and the circle $x^2 + y^2 = 32$ is

A. 16π sq units

B. 4π sq units

C. 32π sq units

D. 24π sq units

Answer: B

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16. Area of the regionbounded by the curve $y = \cos x$ between $x = 0$ and $x = \pi$ is

A. 2 sq units

B. 4 sq units

C. 3 sq units

D. 1 sq unit

Answer: A

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

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

B. 1 sq unit

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

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

Answer: A

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

    A. 2 sq units

    B. 4 sq units

    C. 3 sq units

    D. 1 sq unit

Answer: D

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

    A. 20π sq units

    B. $20\pi^2$ sq units

    C. $16\pi^2$ sq units

    D. 25π sq units

Answer: A

20. The area of the region by the circle $x^2 + y^2 = 1$ is

    A. 2π sq units

    B. π sq units

    C. $3\pi^2$ sq units

    D. 4π sq units

Answer: B

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

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

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

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

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

Answer:

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

A. 4 sq units

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

C. 6 sq units

D. 8 sq unit

Answer: C