MATHS

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APPLICATION OF INTEGRALS

Exercise

1. Find the points of intersection of the parabola $y^2 = 8x$ and the line y=2x.

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2. The area bounded by the parabola $y^2 = 8x$ and its latus rectum (in sq unit) is a)$16/3$ b)$32/3$ c)$8/3$ d)$64/3$

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3. Find the area enclosed between the curve $x^2 = 4y$ and the line x = 4y - 2

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4. Draw the graph of the function $y = x^2$ and $x = y^2$ in a coordinate axis.

5. Consider the parabolas $y^2 = 4x, x^2 = 4y$

Find the point of intersection of the two parabolas.

6. Given the graphs of $y = x^2$ and $x = y^2$. Express the area of the region bounded by the parabolas as a definite integral.

7. Consider the parabolas $y = x^2$ and $y^2 = x$. Find the area of the region bounded by the two parabolas.

8. Find the area of the region bounded by the curve $y^2 = 8x$ and the x-axis at x=1 and x=3.

9. Draw the rough sketch of $y^2 + 1 = x, x \leq 2$ and find the area enclosed by the curve and the ordinate at x=2.

10. Using integration find the area of the region bounded by the curves $y = x^2 + 2$, y=x,x=0 and x=3.

11. Draw a rough sketch of the region enclosed by $y^2 = x$ and x+y=2.

12. Draw a rough sketch of the curves y=x and

$y = x^3.$

13. Draw a rough sketch of the curves y=sinx

and y=cosx as 'x' varies from 0 to $\pi/2$.

14. Find the points of intersection of the parabola $y^2 = 8x$ and the line y=2x.

15. Find the area of the region bounded by the curve $y = |x|$ and the x-axis between x=-4 and x=2.

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

17. Choose the correct answer. Smaller area enclosed by the circle $x^2 + y^2 = 4$ and the line x+y=2 is:

18. Find the area of a circle of radius r, by integration.

19. Find the area of the circle ,

$$x^2 + y^2 = 16$$

which Is exterior to parabola

$$y^2 = 6x$$

20. The area of the triangular region whose sides are y = 2x +1, y = 3x + 1 and x = 4 is a)5 b)6 c)7 d)8

21. Choose the correct answer. Area of the region bounded by the curve $y^2 = 4x$, y-axis and the line y=3 is :

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

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

24. Find the area lying above x-axis and included between the circle $x^2 + y^2 = 8x$ and parabola $y^2 = 4x$.

25. Find the area of the region bounded by the $y^2 = 4ax$ and $x^2 = 4ay$, a>0

26. Using integration find the area of the region bounded by the parabola $y^2 = 4x$ and the circle $4x^2 + 4y^2 = 9$.

27. Draw the graph of the function $y = x^2$ and $x = y^2$ in a coordinate axis.

28. Consider the functions f(x)=sinx and g(x)=cosx in the interval $[0, 2\pi]$ Find the x coordinates of the meeting points of the functions.

29. Consider the functions $f(x) = \sin x$ and $g(x) = \cos x$ in the interval $[0, 2\pi]$

draw the rough sketch of the above function ?

30. Consider the functions $f(x) = \sin x$ and $g(x) = \cos x$ in the interval $[0, 2\pi]$ find the area enclosed by these curves in the given interval ?

31. Shade the area enclosed by $x^2 = 4y, y = 2, y = 4$ and the y-axis in the

first quadrant ?

32. Find the area of the circle ,

$$x^2 + y^2 = 16$$

which Is exterior to parabola

$$y^2 = 6x$$

33. Draw a rough sketch of the graph of the function

$$y^2 = 4x$$

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34. Make a rough sketch of the curves $y = x^2$ and y=|x|.

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35. The co-ordinates of the vertices of $\triangle ABC$ are A(2,0), B(4,5) and C(6,3).Find the equations of the sides AB,BC and CA.

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37. The area bounded by the curve y=f(x), x-axis and the line x=a and x=b is ?

A. $\displaystyle\int_a^b xdy$

B. $\displaystyle\int_a^b ydx$

C. $\displaystyle\int_a^b x^2dy`$

D. $\displaystyle\int_a^b y^2dx$

Answer:

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38. Area bounded by the curve $y = f(x)$, x axis and the linesx=a and $x = b$ is

A. $\displaystyle\int_a^b x\,dy$

B. $\displaystyle\int_a^b x^2\,dy$

C. $\displaystyle\int_a^b y\,dx$

D. $\displaystyle\int_a^b y^2\,dx$

Answer:

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39. Find the area bounded by the curve y= sin x with x-axis, between x=0 and $x = 2\pi$

40. Find the area of the region bounded by the curve

$$y^2 = x$$

x-axis and the lines x=1 and x=4

41. Area bounded by the curves y=cosx , $x = \dfrac{\pi}{2}$

, x=0, y=0 is

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

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

C. 1

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

Answer:

42. Find the area of the region bounded by the

$y^2 = 4ax$ and $x^2 = 4ay$, a>0

43. The area bounded by the curve above the

x-axis, between $x = a$ and $x = b$ is

A. $\int_{f(a)}^{b} y\,dy$

B. $\int_{a}^{f(b)} x\,dx$

C. $\int_{a}^{b} x\,dy$

D. $\int_{a}^{b} y\,dx$

Answer:

44. Find the area of the circle

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

using integration

45. Consider the function

$$f(x) = |x| + 1, \, g(x) = 1 - |x|$$

sketch the graph and shade the enclosed region between them

46. Consider the functions: $f(x) = |x| - 1$ and $g(x) = 1 - |x|$. Find the area of their shaded region.

47. Find the point at which the circle $x^2 + y^2 = 32$ intersects the positive x-axis.

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48. Shade the region in the first quadrant enclosed by x-axis, the line y=x and the circle $x^2 + y^2 = 32$

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49. Find the area bounded by the curve y= sin x with x-axis, between x=0 and $x = 2\pi$

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

51. Choose the correct answer. Area lying between the curves $y^2 = 4x$ and y=2x is :

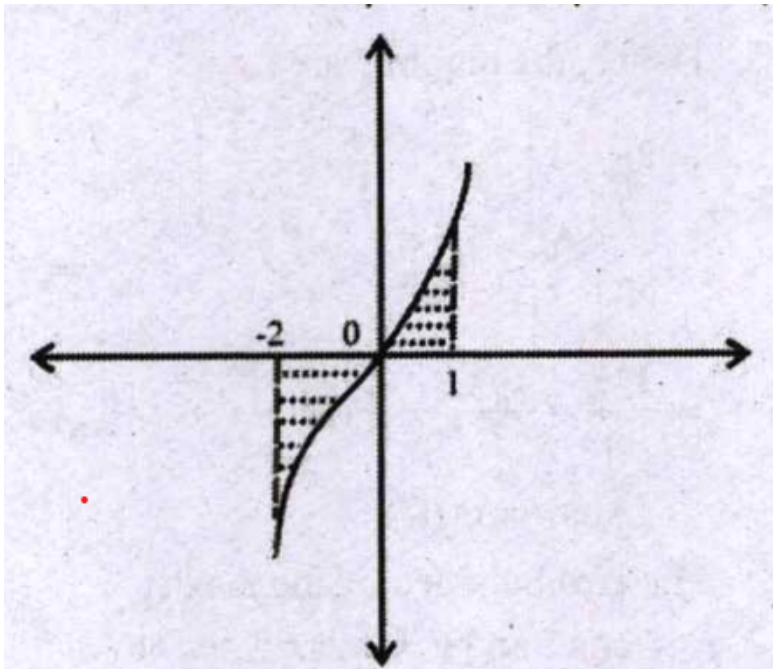**52.** Find the area between the curves y=x and $y = x^2$.

53. Choose the correct answer. Area bounded by the curve $y = x^3$,The x-axis and the ordinates.

x=-2 and x=1 is: