MATHS

BOOKS - PRADEEP PUBLICATION

APPLICATIONS OF INTEGRALS

Example

1. Using integration , find the area enclosed by a circle of radius a.

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2. find the area under the curve $y = \sqrt{3x + 4}$,lying between x= 0 and x= 4.

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3. Make a rough sketch of the graph of $y = x^2$ and compute the area under the curve, above the x-axis and the line x= 22 and x= 4.

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4. Find the area of region bounded by

The parabola $y^2 = 4ax$ and its latus rectum

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

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6. Make a rough sketch of the graph of the function $y = 3\sin x, 0 \leq x \leq \pi$ and compute the

area enclosed between the curve and the X-axis.

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

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8. Using the integration, find the area of the triangle whose vertices are $(-1, 6), (1, 2)$ and $(5, 4)$.

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9. Using the method of integration, find the area of the triangular region whose vertices are (2,-2),(4,3) and (1,2).

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

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11. Find the smaller of the two areas in which the circle $x^2 + y^2 = 2a^2$ is divided by the parabola $y^2 = ax$, a>0.

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12. Find the smaller of the two areas bounded by the circles $x^2 + y^2 = 4, (x - 2)^2 + y^2 = 4.$

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13. (i) Find the area of the region given by: $\{(x, y) : x^2 \leq y \leq |x|\}.$

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

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15. Find the area bounded by the curve $y = x^2 - 4$ and the lines y = 0 and y = 5.

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16. Find the area enclosed by the parabola $x^2 = 4y$ and the lines x= 4y-2.

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17. Draw a rough sketch of the curves $y = \sin x$ and $y = \cos x$ as x varies from 0 to $\frac{\pi}{2}$ and find the area enclosed by them find x-axis.

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18. Find the area bounded by the x-axis, part of the curve $y = 1 + \frac{8}{x^2}$ and the ordinates at x= 2 and x= 4. If the ordinate at x= a divides the area into two equal parts , find a.

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

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20. Find the area enclosed between the curve

$y = \tan x, -\frac{\pi}{2} \leq x \leq \frac{\pi}{2},$

the x-axis and the tangent to this curve at $x = \frac{\pi}{4}$.

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21. Using integration, find the area of the triangle formed by positive x-axis and tangent and normal to the circle $x^2 + y^2 = 4$ at $\left(1, \sqrt{3}\right)$.

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22. Find the area bounded by the curves $x^2 + y^2 = 25, 4y = |4 - x^2|$ and x= 0 which lies in the first quadrant.

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

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24. Sketch the region bounded by the curves: $y = \sqrt{5 - x^2}$ and y=|x-1| and find its area, using integration.

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25. Find the area enclosed between the curve $y = \sin x$ and $y = \cos x$ that lies between thhe lines x= 0 and $x = \frac{\pi}{2}$.

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

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27. Prove that the curves $y^2 = 4x, x^2 = 4y$, divide the area of the square bounded by $x = 0, x = 4, y = 4, y = 0$ into three equal parts.

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Exercise

1. Using integration, find the region bounded by the line 2y=-x+8, x-axis, and the lines x=2 and x=4.

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2. 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.

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3. Make a rough sketch of the graph of the function $f(x) = 9 - x^2, 0 \leq x \leq 3$ and

determine the area enclosed between the curve and the axes.

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4. Sketch the rough graph of $y = 4\sqrt{x-1}, 1 \leq x \leq 3$ and complete the area between the curve, x-axis and the line x= 3.

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5. Draw rough sketch of the function $y = 2\sqrt{1-x^2}, x \in [0, 1]$ and evaluate the area

enclosed between the curve and the x-axis.

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6. Find the area enclosed between the curve $y^2 = 8x$ and the line x= 2.

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7. Find the area of the regionn bounded by the curve $y^2 = x$, the x-axis and the lines x= 1, x= 4 and which lies above x-axis.

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8. Make a rough sketch of the functionn $y = x^2, 0 \leq x \leq 3$ and determine the area enclosed between the curve, the x-axis and the line x= 3.

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9. Find the area of the regionn bounded by the curve $x^2 = 4y$, the y-axis the lines y = 2, y= 4 and which lies in the first quadrant.

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10. Make a rough sketch of the graph of the function $y = 4 - x^2, 0 \leq x \leq 2$ and determine the area enclosed between the curve and the lines x= 0, x= 2 and x-axis.

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11. Sketch the graph of the curve $y = \sqrt{x} + 1$ in the interval [0,4] and determine the area of the region enclosed by the curve, the x-axis and the lines x= 0 and x= 4.

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12. Make a rough sketch of the curve $y = 2\sin x, 0 \leq x \leq \pi$, and determine the area of the region enclosed between the curve and the x-axis.

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13. (ii) Draw the graph of y=cos 3x, $0 \leq x \leq \frac{\pi}{6}$ and find the area between the curve and the axes.

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14. (i) Make a rough sketch of the graph of the function y=sin x,$0 \leq x \leq \frac{\pi}{2}$ and determine the area enlosed between the curve, the, the x-axis and the line $x = \frac{\pi}{2}$.

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15. Make a rough sketch of the graph of the function $y = \cos^2 x, 0 \leq x \leq \frac{\pi}{2}$ and determine the area inclosed between thhe curve and the axes.

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16. 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.

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17. Using integration find the area of region bounded by the triangle where vertices are : (2,5), (4,7) and (6,2)

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

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

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20. Using integration find the area of the circle $x^2 + y^2 = r^2$.

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21. Sketch the region $\{(x, y) : 4x^2 + 9y^2 = 36\}$ and find its area using integration.

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22. Make a rough sketch of the curve $\frac{x^2}{4} + \frac{y^2}{9} = 1$ and find

the area under the curve above the x-axis.

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23. Make a rough sketch of the curve $\frac{x^2}{4} + \frac{y^2}{9} = 1$ and find the area enclosed by the curve above the x-axis.

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24. Find the area between the curve $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ and the x-axis between x=0 and x=a. Draw a rough sketch of the curve also.

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25. Calculate the area enclosed by the curve $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1.$

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26. Triangle AOB is in the first quadrant of the ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ where OA = a and OB = b. Find the area enclosed between the chord AB and the arc AB of the ellipse.

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

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28. Using integration, find the area of the region represented by $\left\{(x, y): \frac{x^2}{9}+\frac{y^2}{4} \leq 1 \leq \frac{x}{3}+\frac{y}{2}\right\}.$

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29. 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 arc AB and the chord AB.

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30. Find the area of the region by the curve $xy - 3x - 2y - 10 = 0$, X-axis and the line $x = 3, x = 4.$

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

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

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

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34. find the area of the region

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

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35. Find the area bounded by the curve $y^2 = 4ax$ and the lines y = 2a and y-axis.

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36. Sketch the region bounded by the curve $y = 2x - x^2$ and the x-axis and find its area, by using integration.

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37. Find the area bounded by curves $(x-1)^2 + y^2 = 1$ and $x^2 + y^2 = 1$.

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

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39. Find the smaller of the two areas enclosed by the curves $x^2 + y^2 = 4$ and $y^2 = 3(2x - 1)$.

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40. Using integration , find the area of the region given below.

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

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

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42. Find the area of the region bounded by the curve $y = x^2 + 2, y = x, x = 0$ and $x = 3$

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43. Sketch the region lying in the first quadrant and bounded by $y = 9x^2$, x= 0, y = 1 and y= 4. find the area of this regionn using integration.

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44. Draw a rough sketch of the curve $y^2 = 4a^2(x-1)$ and find the area by curve and the lines x=1 and y=4a

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45. Find the area lying in the first quadrant bounded by the curves $x^2 + y^2 - 2ax = 0$ and $y^2 = ax$.

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46. Find the area of the region $\{(x, y) : y^2 \leq 4x, 4x^2 + 4y^2 \leq 9\}$.

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

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48. Find the area included between the curves

$y = x^2$ and $x^2 + 4(y - 1) = 0$

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49. Find the area of the region bounded by the curves $y = 6x - x^2$ and $y = x^2 - 2x$.

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50. Find the area bounded by the curve $y^2 = 2y - x$ and the Y-axis.

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51. Find the area of the regionn bounded by y = -1, y = 2, $x = y^3$ and x= 0.

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

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53. Using integration, find the area of the region:

$\left\{(x, y): |x-1| \leq y \leq \sqrt{5-x^2}\right\}$.

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

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55. Using the method of integration, find the area of the region bounded by the lines : 3x-2y+1=0, 2x+3y-21=0 and x-5y+9=0.

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

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57. (a) Using integration, find the area of the region bounded by the triangle whose sides are : (i) 3x-y-3=0, 2x+y-12=0, x-2y-1=0.

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58. Prove that the curves $y^2 = 4x, x^2 = 4y$, divide the area of the square bounded by $x = 0, x = 4, y = 4, y = 0$ into three equal parts.

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59. Compute the area enclosed by the curves $y = 2^x$ and $y = \log_2 x$ between the lines $x = \frac{1}{2}$ and x= 2.

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60. Compute the area enclosed by the curves $y = e^x$ and $y = \log_e x$ between the lines $x = 1$ and x= 2.

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61. Find the area enclosed by the lines y = 0, y= x, x= 1, x=2.

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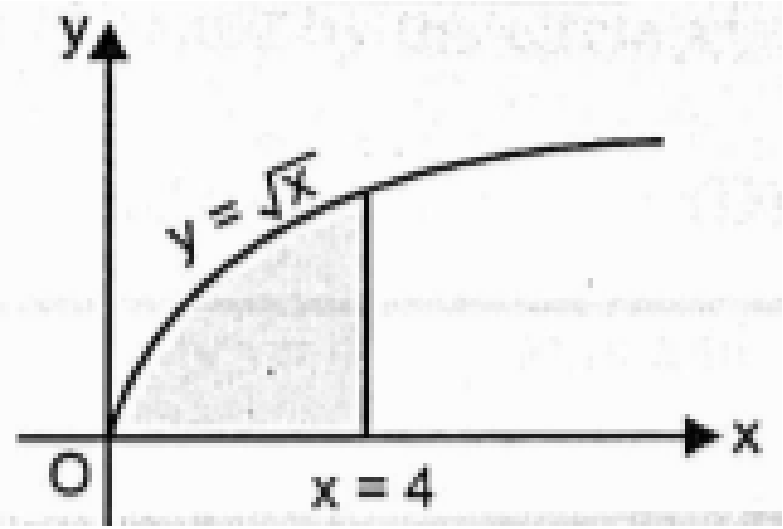
62. Compute the area shown shaded in the figure.



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63. Find the area enclosed by the curves $x = \sqrt{y}$, y=0 and $x = \sqrt{2}$.

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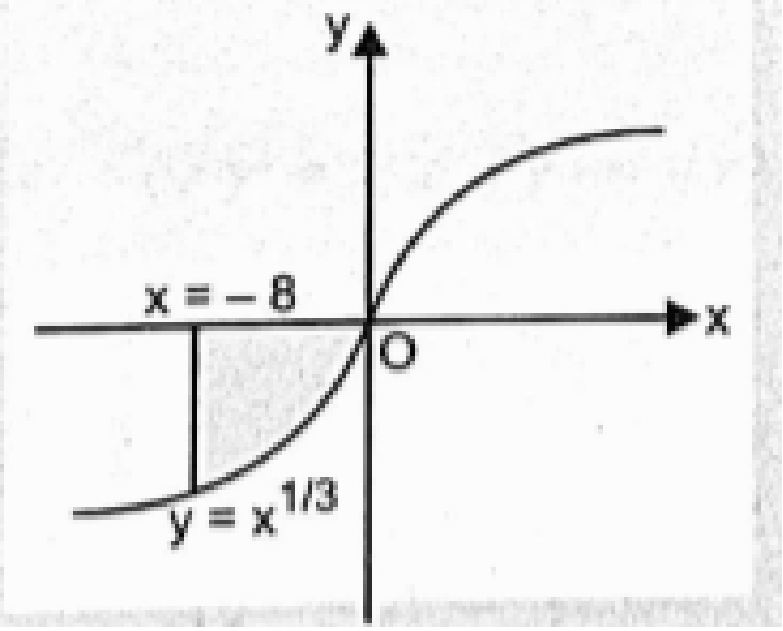
64. Compute the area shown shaded in the figure.



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65. Find the area bounded by the curves $y = \sqrt{1 - x^2}$ and y = 0.

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66. Find the area bounded by the lines x= 0, y= 0 and x+y = 1.

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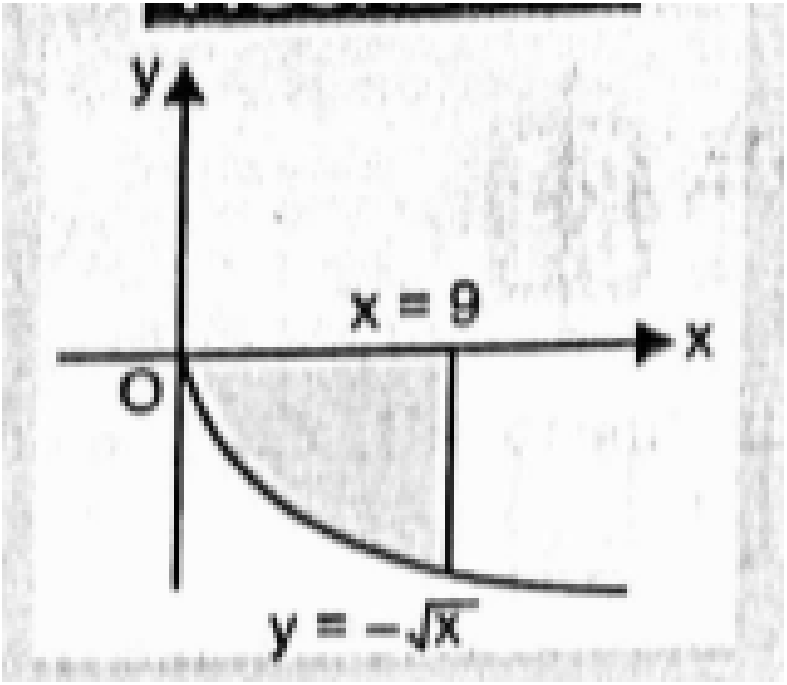
67. Find the area shown shaded in the figure



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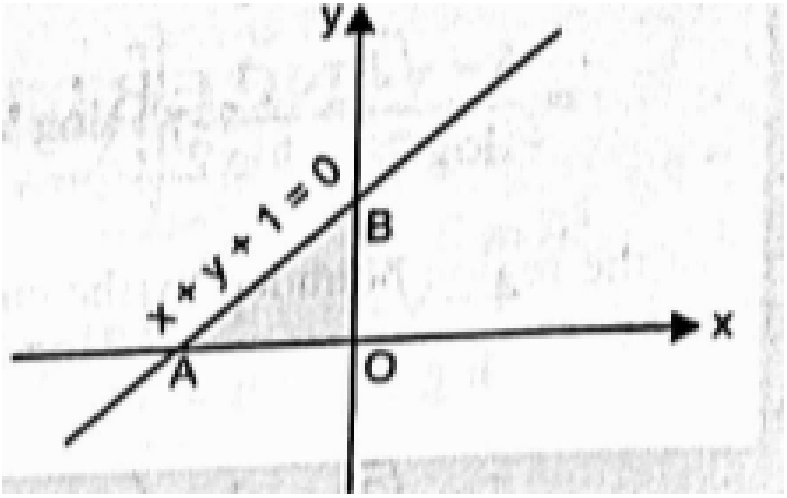
68. Find the area shown shaded in the figure



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69. Find the area bounded by the curves $y = e^x$, x= 0, y= 0 , x= 1.

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70. Find the area bounded by the curves $y = \log_e x$, x,y=0 and x=e.

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71. Find the area enclosed between the curve $y = \sqrt{x-1}$, the x-axis and the line x= 5.

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72. Find the area enclosed betweenn $y = \sin x$ and the x-axis from x= 0 to $x = \pi$.

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73. (i) 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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74. Find the area of the region bounded by the curve $y = x$, and the lines $x = 1, x = 4$ and the x-axis.

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

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

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77. Find the area of region bounded by the ellipse

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

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78. Find the area of region bounded by the ellipse

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

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79. Find the area of the region in the first quadrant enclosed by x-axis, line $x = \left(\sqrt{3}\right)y$ and the circle

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

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

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81. 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.

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

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

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

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

A. π

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

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

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

Answer:

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

A. 2

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

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

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

Answer:

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

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88. Find the area bounded by curves $(x-1)^2 + y^2 = 1$ and $x^2 + y^2 = 1$.

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89. Find the area of the region bounded by the curve $y = x^2 + 2, y = x, x = 0$ and $x = 3$

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

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91. Using integration find the area of triangle whose sides are given by the equations $y = 2x + 1, y = 3x + 1, x = 4.$

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92. 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:

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93. Area lying between the curve $y^2 = 4x$ and the line $y = 2x$ is :

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

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

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

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

Answer:

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94. Find the area under the given curves and given lines: $y = x^2, x = 1, x = 2$ and x-axis

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95. Find the area under the given curves and given lines: $y = x^4, x = 1, x = 5$ and x-axis.

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

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

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

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

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

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

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

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

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

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105. Using the method of integration find the area bounded by the curve $|x| + |y| = 1$

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

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107. 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).

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

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109. Make a rough sketch of the region given below and find its area, using integration : $\{(x, y) : y^2 \leq 4x, 4x^2 + 4y^2 \leq 9\}$

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

A. -9

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

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

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

Answer:

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

A. 0

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

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

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

Answer:

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112. (a) (i)Find the area of the circle $x^2 + y^2 = 16$, which is exterior to the parabola $y^2 = 6x$.

A. $\frac{4}{3}(4\pi - \sqrt{3})$

B. $\frac{4}{3}(4\pi + \sqrt{3})$

C. $\frac{4}{3}(8\pi - \sqrt{3})$

D. $\frac{4}{3}(8\pi + \sqrt{3})$

Answer:

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113. The area bounded by the y-axis, $y = \cos x$ and $y = \sin x, 0 \leq x \leq \frac{\pi}{4}$ is

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

B. $\sqrt{2} - 1$

C. $\sqrt{2} + 1$

D. $\sqrt{2}$

Answer:

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

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115. Fill in the blanks

The area of the region bounded by the curve $x = y^2$, y-axis and the lines y = 3, y = 4 is..... .

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116. Fill in the blanks

Area bounded by the curve $y = \sqrt{x - 3}$ 1< x<4 in first quadrant is equal to..... .

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117. Fill in the blanks

Area of the region enclosed by the curve y = tan x, the x-axis and the line $x = \frac{\pi}{3}$ is..... .

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118. Fill in the blanks

Area enclosed by the curve $y = x - x^2$ and the x-axis, is..... .

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119. Fill in the blanks

The area of the region bounded by the curve $y = x^2 + x$, the x-axis and the lines x= 2, x= 5 is..... .

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120. Fill in the blanks

The area under the curve $y = \sqrt{x}$ from x= 0 to x= 4

is..... .

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121. Fill in the blanks

The area enclosed between the x-axis, the graph of

y = |x| and the ordinates x= -2 and x= 1 is..... .

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122. Fill in the blanks

Area enclosed between the y-axis, graph of $x = \sqrt{y}$ and the line y = 4 is..... .

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123. Fill in the blanks

Area enclosed by the curve $y = x^{1/3}$, the x-axis and the lines x= 1 and x= 8 is..... .

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124. Fill in the blanks

The area enclosed by the curves , $y = \cos x$, X-axis and the line $x = \frac{\pi}{2}$ and which lies on the left of this line is..... .

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125. Fill in the blanks

The are bounded by the axes and the line y= x+1 is..... .

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126. Fill in the blanks

Area bounded by the curves $y = x^2 - 1$ and $y = -x^2 + 1$ is..... .

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127. In case of each of the following statements, state whether it is true or false:

The area enclosed by the x-axis, the graph of $y = x^3$ and the lines x= -1, x= 1 is twice the area lying in the first quadrant and bounded by the curves $y = x^3$, y = 0 and x= 1.

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128. In case of each of the following statements, state whether it is true or false:

The area bounded by curves $y = \sqrt{x}$ and $y = x^2$ is equal to $\int_0^1 (\sqrt{x} - x^2)\,dx$.

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129. In case of each of the following statements, state whether it is true or false:

The area enclosed by the curve $4x^2 + 4y^2 = 9$ is equal to $\frac{9}{4}\pi$ square units.

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130. Evaluate

$$\int (\cos x - \sin x) \frac{dx}{\sin x + \cos x}$$

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131.

The area enclosed between the graph of y = x , the x-axis and the ordinates x= a, x= b (a < b)

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132. The area of the circle $x^2 + y^2 = a^2$ is :

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133. In case of each of the following statements, state whether it is true or false:

The area under the curve $y = \sqrt{1 - x^2}$ is equal to $\int_{-1}^{1} \sqrt{1 - x^2} dx$.

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134. In case of each of the following statements, state whether it is true or false:

The area enclosed between the curves $y = x^2$ and $x = y^2$ is eqaul to $\int_0^1 (x^2 - \sqrt{x})dx$.

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135. In case of each of the following statements, state whether it is true or false:

The area bounded by curves $y = \sqrt{x}$ and $y = x^2$ is equal to $\int_0^1 (\sqrt{x} - x^2)dx$.

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136. In case of each of the following statements, state whether it is true or false:

The area bounded by curves $y = \sqrt{x}$ and $y = x^2$ is equal to $\int_0^1 (\sqrt{x} - x^2)\,dx$.

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137. In case of each of the following statements, state whether it is true or false:

The area bounded by the curve $y = x^2$ and the lines y = 1 and y = 4 is equal to $\int_1^4 \sqrt{y}dy$.

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138. In case of each of the following statements, state whether it is true or false:

The area bounded by $y^2 = x$ and the lines x= 4 and x= 9 is equal to $\int_4^9 \sqrt{x}dx$.

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139. Match the statements in column I with those given in column II.

Column I	Column II
1. Area of the ellipse $\frac{x^2}{b^2}+\frac{y^2}{a^2}=1$ is	(p) $\frac{2}{3}$ square units
2. Area under the curve $y = x^2$ between the ordinates $x = 1$ and $x = 3$ is	(q) $\frac{4}{3}$ square units
3. Area enclosed between the curves $y = \sin x$ and $y = \cos x$ from $x=\frac{\pi}{4}$ to $x=\frac{5\pi}{4}$.	(r) 2 square units
4. Area enclosed between the x-axis and the curve $y = x^2 - 1$ is	(s) $\frac{7}{3}$ square units
5. Area enclosed between the x-axis, y-axis and the curve $y^2 = x + 1$ and which lies above the x-axis is equal to	(t) πab square units
6. Area of the region represented by $\{(x, y) : \lvert x \rvert + \lvert y \rvert \le 1\}$ is	(u) $2\sqrt{2}$ square units
7. Area bounded by the curve $y^2 = x$, the y-axis and the lines $y = 1$, $y = 2$ is	(v) $\frac{26}{3}$ square units

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140. The area enclosed between y = x, x= 1, x= 3 and the x-axis is

A. 2

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

C. 4

D. none of these

Answer:

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141. If graph of $y = f(x)$ is continous between $x = a$ and $x = b, a < b$, then area enclosed between the x-axis, graph of $y = f(x)$and the ordinates $x = a$ and $x = b$ is

A. $\int_a^b f(x)dx$

B. $\int_a^b |f(x)|dx$

C. $\left|\int_a^b f(x)dx\right|$

D. none of these

Answer:

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142. The area enclosed between the graph of $y = 2x - x^2$ and the x-axis is

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

B. 4

C. 8

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

Answer:

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143. The area enclosed between the graph of $y = \cos x, \ -\frac{\pi}{2} \leq x \leq \frac{\pi}{2}$ and the x-axis is

A. 2

B. 1

C. π

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

Answer:

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144. Find the area of the region bounded by the curve $y = 2\sqrt{1 - x^2}$ and x-axis.

A. 8π square units

B. 20π square units

C. 16π square units

D. 256π square units

Answer:

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

A. 4π square units

B. $2\sqrt{2}\pi$ square units

C. $4\pi^2$ square units

D. 2π square units

Answer:

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146. The area bounded by the curve $y = \sin x, \pi \leq x \leq 2\pi$ and the x-axis is

A. -2

B. $-\pi$

C. π

D. 2

Answer:

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147. Area enclosed between thhe graph of $y = x^2$ x-axis and the lines x= -1, x= 1 is

A. 0

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

C. 1

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

Answer:

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148. The area enclsoed between the graph of $y = x^3$ and the lines x= 0, y=1, y= 8 is

A. $\frac{45}{4}$

B. 14

C. 7

D. none of these

Answer:

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149. 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 square units

B. 4π square units

C. 32π square units

D. 24 square units

Answer:

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150. Area of ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1, a > b$ is :

A. $\pi^2 ab$

B. πab^2

C. $\pi a^2 b$

D. πab

Answer:

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151. The area of the region bounded by the curve $y = x^2$ and the line y=16 is:

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

B. $\frac{256}{3}$

C. $\frac{64}{3}$

D. $\frac{128}{3}$

Answer:

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152. 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.

A. 2

B. $2^{4/3}$

C. $2^{5/3}$

D. none of these

Answer:

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153. The area enclosed between y = x and $y^2 = x$ is given by

A. $\int_0^1 (x - x^2)\,dx$

B. $\int_0^1 \left(x - \sqrt{x}\right) dx$

C. $\int_0^1 \left(x^2 - x\right) dx$

D. $\int_0^1 \left(\sqrt{x} - x\right) dx$

Answer:

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154. The area enclosed between y = x and $y^2 = x$ is given by

A. $\int_0^1 \left(x^2 - x dx\right.$

B. $\int_0^1 (x - x^2)\,dx$

C. $\int_0^1 (x - \sqrt{x})\,dx$

D. none of these

Answer:

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155. The area of the region bounded by the curve $y = \cos x$ between x= 0 and $x = \pi$ is

A. 2 square units

B. 4 square units

C. 3 square units

D. 1 square units

Answer:

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

A. $\frac{\pi}{4}$

B. $\frac{\pi}{4} - 1$

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

D. none of these

Answer:

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

A. 4 square units

B. $\frac{3}{2}$ square units

C. 6 square units

D. 8 square units

Answer:

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

A. $\frac{7}{2}$ square units

B. $\frac{9}{2}$ square units

C. $\frac{11}{2}$ square units

D. $\frac{13}{2}$ square units

Answer:

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

A. $\frac{2}{3}$ square units

B. 1 square units

C. $\frac{4}{3}$ square units

D. $\frac{1}{3}$ square units

Answer:

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

A. $4\pi - \frac{32}{3}$

B. $4\pi + \frac{32}{3}$

C. $8\pi - \frac{32}{3}$

D. none of these

Answer:

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161. The area of the circle $x^2 + y^2 = 8x$, lying above x-axis and interior to the parabola $y^2 = 4x$ is

A. $4\pi - \frac{32}{3}$

B. $4\pi + \frac{32}{3}$

C. $8\pi + \frac{32}{3}$

D. none of these

Answer:

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

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