

MATHS

BOOKS - CENGAGE MATHS (ENGLISH)

APPLICATION OF INTEGRALS

Others

1. Find the area of the figure enclosed by the curve $5x^2 + 6xy + 2y^2 + 7x + 6y + 6 = 0.$

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2. If the area by $y = x^2 + 2x - 3$ and the line y = kx + 1 is the least,

find k and also the least area.

3. Area enclosed by the curve y=f(x) defined parametrically as $x=rac{1-t^2}{1+t^2}, y=rac{2t}{1+t^2}$ is equal

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4. Sketch and find the area bounded by the curve $\sqrt{|x|} + \sqrt{|y|} = \sqrt{a}$ and $x^2 + y^2 = a^2$ (where a > 0). Ifcurve|x|+|y|=a` divides the area in two parts, then find their ratio in the first quadrant only.

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5. Let
$$f(x) = \min(x+1, \sqrt{1-x})$$
 for all $x \le 1$. Then the area
bounded by $y = f(x)$ and the x-axis is (a) $\frac{7}{3}$ sq units (b) $\frac{1}{6}$ sq units (c) $\frac{11}{6}$ sq units (d) $\frac{7}{6}$ sq units

6. The area enclosed by $2|x| + 3|y| \le 6$ is 3 sq. units (b) 4 sq. units 12 sq.

units (d) 24 sq. units



7. If A_n is the area bounded by y=x and $y=x^n, n\in\mathbb{N}$,then $A_2A_3...A_n=$ (a) $rac{1}{n(n+1)}$ (b) $rac{1}{2^nn(n+1)}$ (c) $rac{1}{2^{n-1}n(n+1)}$ (d) $rac{1}{2^{n-2}n(n+1)}$

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8. Area enclosed between the curves $|y|=1-x^2$ and $x^2+y^2=1$ is (a)

$$rac{3\pi-8}{3}$$
 (b) $rac{\pi-8}{3}$ (c) $rac{2\pi-8}{3}$ (d) None of these

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9. If the area of bounded between the x-axis and the graph of $y = 6x - 3x^2$ between the ordinates x = 1 and x = a is 19 units, then a

can take the value: (A) 4 or -2 (B) one value is in (2, 3) and one in (-1, 0) (C) one value is in (3, 4) and one in (-2,-1) (D) none of these



10. The area enclosed between the curves
$$y = (\log)_e(x+e), x = (\log)_e\left(rac{1}{y}
ight)$$
, and the x-axis is (a) $2squarts$ (b)

1 squarts (c) 4 squarts (d) none of these

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11. If A_n be the area bounded by the curve $y = (\tan x)^n$ and the lines

 $x=0,\;y=0,\;x=\pi/4$, then for n>2.

A. a.
$$A_n + A_{n-1} = rac{1}{n-1}$$

B. b. $A_n + A_{n-2} < rac{1}{n-1}$
C. c. $A_n + A_{n-2} = rac{1}{n-1}$

D. d. none of these

Answer: null



12. Find all the possible values of b > 0, so that the area of the bounded region enclosed between the parabolas $y = x - bx^2 andy = \frac{x^2}{b}$ is maximum.

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13. In the hexaploid wheat, the haploid (n) and basic (x) numbers of chromosomes are

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14. Let
$$O(0,0), A(2,0), and B\left(1\frac{1}{\sqrt{3}}\right)$$
 be the vertices of a triangle. Let

R be the region consisting of all those points P inside OAB which

satisfy $d(P, OA) \leq \min[d(p, OB), d(P, AB)]$, where d denotes the distance from the point to the corresponding line. Sketch the region R and find its area.



15. A copper rod of mass m rests on two horizontal rails distance L apart and carries a current of I from one rail to the other. The coefficient of static friction between rod and rails is μ_s What are the (a) magnitude and (b) angle (relative to the vertical) of the smallest magnetic field that puts the rod on the verge of sliding?

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16. The area bounded by the x-axis, the curve $y=f(x),\;$ and the lines x=1,x=b is equal to $\sqrt{b^2+1}-\sqrt{2}$ for all $b>1,\;$ then f(x) is

A. (a) $\sqrt{x-1}$

B. (b) $\sqrt{x+1}$

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

D. (d)
$$rac{x}{\sqrt{1+x^2}}$$

Answer: null

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17. A particle moves along x-axis such that its position veries with time as $x = 50t - 5t^2$. Select the correct alternative (s).



18. Masses M_1 , M_2 and M_3 are connected by strings of negligible mass which pass over massless and frictionless pulleys P_1 and P_2 as shown in the figure. The masses move such that the portion of the string between P_1 and P_2 is parallel to the inclined plane and the portion of the string between P_2 and M_3 is horizontal. The masses M_2 and M_3 are 4.0 kg each and the coefficient of kinetic friction between both the masses and the surfaces is 0.25. The inclined plane makes an angle of 37° with the horizontal. If the mass M_1 moves downwards with a uniform velocity, find (i) the mass of M_1 in kg

(ii) the tension in the horizontal portion of the string in Newton



19. The area bounded by the two branches of curve $(y-x)^2 = x^3$ and the straight line x = 1 is (a) $\frac{1}{5}square{inits}$ (b) $\frac{3}{5}square{inits} \frac{4}{5}square{inits}$ (d) $\frac{8}{4}square{inits}$

20. The area bounded by the curves $y = \log_e x$ and $y = \left(\log_e x\right)^2$ is (A)

e-2 sq. units (B) 3-e sq. units (C) e sq. units (D) e-1 sq. units



21. The area of the region containing the points (x,y) satisfying $4 \le x^2 + y^2 \le 2(|x| + |y|)$ is (a) $8square{units}$ (b) $2square{units}$ (c) $4\pi square{units}$ (d) $2\pi square{units}$

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22. Let $f(x) = x^3 + 3x + 2andg(x)$ be the inverse of it. Then the area bounded by g(x), the x-axis, and the ordinate at x = -2andx = 6 is (a) $\frac{9}{4}square (b) \frac{4}{3}square (c) \frac{5}{4}square (d) \frac{7}{3}square (d) \frac{7}$

23. Consider two curves $C_1: y^2 = 4\left[\sqrt{y}\right]x$ and $C_2: x^2 = 4\left[\sqrt{x}\right]y$, where [.] denotes the greatest integer function. Then the area of region enclosed by these two curves within the square formed by the lines x = 1, y = 1, x = 4, y = 4 is (a) $\frac{8}{3}squarts$ (b) $\frac{10}{3}squarts$ (c) $\frac{11}{3}squarts$ (d) $\frac{11}{4}squarts$

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24. The area enclosed between the curve $y^2(2a - x) = x^3$ and the line x = 2a above the x-axis is (a) $\pi a^2 square x$ (b) $\frac{3\pi a^2}{2} square x$ (c) $2\pi a^2 square x$ (d) $3\pi a^2 square x$

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25. The area of the region of the plane bounded by $\max(|x|,|y|) \le 1$ and $xy \le \frac{1}{2}$ is (a) $\frac{1}{2} + \ln 2 \, sq$ units (b) $3 + \ln 2 \, sq$ units

27. The area of the loop of the curve
$$ay^2 = x^2(a-x)$$
 is

A. (a)
$$4a^2sq\,units$$

B. (b)
$$\frac{8a^2}{15} sq units$$

C. (c) $\frac{16a^2}{9} sq units$

D. (d) None of these

Answer: null



28. The area of the region bounded by $x=0, y=0, x=2, y=2, y\leq e^x$ and $y\geq 1nx$ is (a) $6-41n2square{units}$

(b) 41n2-2squarts~21n2-4squarts (d) 6-21n2squarts

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$$f(x)=\sin x,\,orall x\in \Big[0,rac{\pi}{2}\Big],f(x)+f(\pi-x)=2,\,orall x\in \Big(rac{\pi}{2},\pi\Big] and f(x)$$

then the area enclosed by y=f(x) and the x-axis is

- (a) π sq \cdot units
- (b) 2π sq \cdot units
- (c) $2 \text{ sq} \cdot \text{units}$
- (d) 4sq · units

30. The area enclosed by the curve $y=\sqrt{4-x^2}, y\geq \sqrt{2}\sin\!\left(rac{x\pi}{2\sqrt{2}}
ight)$,

and the x-axis is divided by the y-axis in the ratio.

(a)
$$\frac{\pi^2 - 8}{\pi^2 + 8}$$

(b) $\frac{\pi^2 - 4}{\pi^2 + 4}$
(c) $\frac{\pi - 4}{\pi - 4}$
(d) $\frac{2\pi^2}{2\pi + \pi^2 - 8}$

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31. The area bounded by the curves $y = xe^x, y = xe^{-x}$ and the lines

$$x = 1$$
 is

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32. The area enclosed by the curves $xy^2=a^2(a-x)$ and $(a-x)y^2=a^2x$ is

33. The area bounded by the loop of the curve $4y^2 = x^2(4-x^2)$ is (a)7/3 sq. units (b) $\frac{8}{3}squartes \frac{11}{3}squartes$ (d) $\frac{16}{3}squartes$

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34. The area bounded by the curve $f(x) = x + \sin x$ and its inverse function between the ordinates x = 0and $x = 2\pi$ is $4\pi squares$ (b) $8\pi squares$ 4squares (d) 8squares

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35. The area enclosed by the curve $y = \sin x + \cos x$ and $y = |\cos x - \sin x|$ over the interval $\left[0, \frac{\pi}{2}\right]$ is $(a)4(\sqrt{2}-2)$ (b) $2\sqrt{2}(\sqrt{2}-1)(c)2(\sqrt{2}+1)$ (d) $2\sqrt{2}(\sqrt{2}+1)$





39. For a point P in the plane, let $d_1(P)andd_2(P)$ be the distances of the

point P from the lines x - y = 0 and x + y = 0 respectively. The area of

the region R consisting of all points P lying in the first quadrant of the plane and satisfying $2 \le d_1(P) + d_2(P) \le 4$, is

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40. If a(a > 0) is the value of parameter for each of which the area of the

figure bounded by the straight line $y=rac{a^2-ax}{1+a^4}$ and the parabola $y=rac{x^2+2ax+3a^2}{1+a^4}$ is the greatest, then the value of a^4 is____

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41. Consider two curves $C_1: y = \frac{1}{x} and C_2: y = 1nx$ on the xy plane. Let D_1 denotes the region surrounded by C_1, C_2 , and the line $x = 1andD_2$ denotes the region surrounded by C_1, C_2 and the line x = a. If $D_1 = D_2$, then the sum of logarithm of possible value of a is ______

42. Find the area bounded by $y^2 \leq 4x, x^2 + y^2 \geq 2x, andx \leq y+2$ in

the first quadrant.



43. Find the area of the region R which is enclosed by the curve $y \geq \sqrt{1-x^2}$ and max $\{|x|, |y|\} \leq 4.$

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44. Find the area of the region enclosed by the curves $y = x \log x$ and

$$y=2x-2x^2\cdot$$

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



50. Draw a rough sketch of the curve $y=(x-1)^2(x-2)(x-3)^3$



51. Find the area bounded by (a) $y = (\log)_e |x| and y = 0$ (b)

$$y = \left| \left(\log
ight)_e
ight| x \mid \ | \ andy = 0$$

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52. Sketch the curves and identity the region bounded by $x = \frac{1}{2}, x = 2, y = \ln x, andy = 2^x$. Find the area of this region.

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53. Sketch the region bounded by the curves $y = x^2$ and $y = \frac{2}{1+x^2}$. Find the area.

54. Find the area of the region bounded by the curve C : y=tan x ,tangent

drawn to C at x=pi/4, and the x-axis.



55. Compute the area of the region bounded by the curves $y = ex(\log)_e x and y = \frac{\log x}{ex}$

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56. AOB is the positive quadrant of the ellipse $rac{x^2}{a^2}+rac{y^2}{b^2}=1$ which has

OA = a, OB = b . Then find the area between the arc AB and the chord

AB of the ellipse.



57. Find the area bounded by the curves y=sin x and y=cos x between two

consecutive points of the intersection.



58. In what ratio does the x-axis divide the area of the region bounded by

the parabolas $y = 4x - x^2 andy = x^2 - x$?

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59. Consider a square with vertices at (1, 1)(-1, 1)(-1, -1) and (1, -1). Let S be the region consisting

of all points inside the square which are nearer to the origin than to any edge. Sketch the region S and find its area.



60. Find the area bounded by $y = x^3 - x ext{ and } y$ = $x^2 + x \cdot$



61. Find the area, lying above the x=axis and included between the circle

$$x^2+y^2=8x$$
 and the parabola $y^2=4x\cdot$

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62. Consider the region formed by the lines x = 0, y = 0, x = 2, y = 2. If the area enclosed by the curves $y = e^x andy = 1nx$, within this region, is being removed, then find the area of the remaining region.

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63. Find the area bounded by the curve y = (x - 1)(x - 2)(x - 3) lying

between the ordinates x = 0 and x = 3.



64. Find the area bounded by the parabola $y = x^2 + 1$ and the straight

line x + y = 3.



65. Find the area of the closed figure bounded by the curves $y = \sqrt{x}, y = \sqrt{4 - 3x}$ and y = 0

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66. Find the area of the smaller part of the circle $x^2 + y^2 = a^2$ cut off by

the line
$$x=rac{a}{\sqrt{2}}$$

67. The area enclosed by the curve $c\!:\!y=x\sqrt{9-x^2}(x\ge 0)$ and the x-

axis is_____

68. The area bounded by the curves $y = x(x-3)^2 andy = x$ is_____ (in

sq. units)

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69. Column I, Column II Area enclosed , q. 1. sq. units The smaller area included between the curves $\sqrt{x} + \sqrt{|y|} = 1$ and |x| + |y| = 1, r. 4 sq. units Area bounded by the curves $y = \left[\frac{x^2}{64} + 2\right](where[.]de \neg es$ the greatest integer function), y = x - 1andx = 0 above the x-axis., s. 2/3 sq. units

70. Consider two regions: R_1 : Point P is nearer to (1, 0) then to x = -1. R_2 : Point P is nearer to (0, 0) then to (8, 0). Then which of the following statements are true: *Statement1*: The area of the region common to R_1 and R_2 is $\frac{128}{3}$ squarts. *Statement2*: The area bounded by $x = 4\sqrt{y}$ and y = 4 is $\frac{32}{3}$ squarts.

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71. Statement 1 : The area bounded by $2 \geq max |x-y|, |x|y|$ is 8 sq.

units. Statement 2 : The area of the square of side length 4 is 16 sq. units.

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72. Statement 1 : The area enclosed between the parabolas $y^2 - 2y + 4x + 5 = 0$ and $x^2 + 2x - y + 2 = 0$ is same as that of bounded by curves $y^2 = -4x$ and $x^2 = y$. Statement 2 : Shifting of origin to point (h, k) does not change the bounded area.

73. If the area bounded by the corve $y = x^2 + 1$, y = x and the pair of lines $x^2 + y^2 + 2xy - 4x - 4y + 3 = 0$ is K units, then the area of the region bounded by the curve $y = x^2 + 1$, $y = \sqrt{x - 1}$ and the pair of lines (x + y - 1)(x + y - 3) = 0 is

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74. Let S be the area bounded by the curve $y = \sin x (0 \le x \le \pi)$ and the x-axis and T be the area bounded by the curves $y = \sin x \left(0 \le x \le \frac{\pi}{2} \right), y = a \cos x \left(0 \le x \le \frac{\pi}{2} \right),$ and the x-axis $\left(wherea \in R^+ \right)$ The value of (3a) such that $S: T = 1: \frac{1}{3}$ is_____

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75. Let C be a curve passing through M(2, 2) such that the slope of the tangent at anypoint to the curve is reciprocal of the ordinate of the

point. If the area bounded by curve C and line x=2 is A ,then the value of

$$\frac{3A}{2}$$
is_``

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76. Let f(x) be continuous function given by $f(x)=\{2x,|x|\leq 1$ and $x^2+ax+b,|x|>1\}$.

Find the area of the region in the third quadrant bounded by the curves $x = -2y^2 andy = f(x)$ lying on the left of the line 8x + 1 = 0.

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77. Let C_1C_2 be the graphs of the functions $y = x^2$ and y = 2x, respectively, where $0 \le x \le 1$. Let C_3 be the graph of a function y = f(x), where $0 \le x \le 1$, f(0) = 0. For a point P on C_1 , let the lines through P, parallel to the axis, meet C_2 and C_3 at Q and R, respectively (see Figure). If for every position of $P(onC_1)$, the areas of



81. The area bounded by the curves y = |x| - 1 and y = -|x| + 1 is 1 sq.

units (b) 2 sq. units $2\sqrt{2}$ sq. units (d) 4 sq. units



82. If the area bounded by the curve y=f(x), x-axis and the ordinates x=1 and x=b is (b-1) $\sin(3b+4)$, then find f(x).

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83. The area bounded by the parabolas $y = (x + 1)^2$ and $y = (x - 1)^2 and y = (x - 1)^2$ and the line $y = \frac{1}{4}$ is 4 sq. units (b) 1/6 sq. units 4/3 sq. units (d) 1/3 sq. units

84. The area bounded by the curves $y = \sqrt{x}$, 2y + 3 = x, and x-axis in the 1st quadrant is (A) 18 sq. units (B) $\frac{27}{4}$ sq.units (C) $\frac{4}{3}$ sq.units (D) 9 sq. units







91. f(x) is a continuous and bijective function on R. If $\forall t \in R$, then the area bounded by y = f(x), x = a - t, x = a, and the x-axis is equal to

the area bounded by y = f(x), x = a + t, x = a, and the x-axis. Then

prove that
$$\int_{-\lambda}^{\lambda} f^{-1}(x) dx = 2a\lambda(given that f(a)=0) \cdot$$

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92. Find the continuous function f where $(x^4 - 4x^2) \leq f(x) \leq (2x^2 - x^3)$ such that the area bounded by $y = f(x), y = x^4 - 4x^2$. then y-axis, and the line x = t, where $(0 \leq t \leq 2)$ is k times the area bounded by $y = f(x), y = 2x^2 - x^3$,y-axis, and line x = t (where $0 \leq t \leq 2$).

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93. Find the area bounded by the curves $y = -x^2 + 6x - 5$, $y = -x^2 + 4x - 3$, and the straight line y = 3x - 15 and lying right to x = 1.

94. Find the value of a where (a > 2) for which the reciprocal of the area enclosed between $y = \frac{1}{x^2}$, $y = \frac{1}{4(x-1)}$, x = 2, andx = a is a itself and for what values of $b \in (1, 2)$, the area of the figure bounded by the lines $x = bandx = 2is1 - \frac{1}{b}$.

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95. if $A_1,A_2,A_3,...,A_{100}$ are set of $A_1 \supset A_2 \supset A_3 \supset A_4.... \supset A_{100}$ $n(A_i)=i+2$, $\cap_{i=3}^{100}A_i$ =

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96. Draw the rough sketch of $y^2 + 1 = x, \ x \leq 2$. Find the area enclosed

by the curve and the line x = 2.

97. Each question has four choices a,b,c and d, out of which only one is correct. Each question contains STATEMENT 1 and STATEMENT 2. If both the statements are TRUE and STATEMENT 2 is the correct explanation of STATEMENT 1 If both the statements are TRUE but STATEMENT 2 is NOT the correct explanation of STATEMENT 1. If STATEMENT 1 is TRUE and STATEMENT 2 is FALSE. If STATEMENT 1 is FALSE and STATEMENT 2 is TRUE. Statement 1 : The area bounded by $y = e^x$, y = 0 and x = 0 is 1 sq. unites. Statement 2 : The area bounded by $y = (\log)_e x$, x = 0, and y = 0 is 1 sq. units.

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98. If A_1, A_2, A_3, \ldots are sets such that $n(A_i) = 101 - i$, $A_1 \supset A_2 \supset A_3 \supset \ldots \supset A_{100}$ and $A = \bigcap_{i=5}^{100} A_i$ then n(A) is equal to

99. Let
$$A(k)$$
 be the area bounded by the curves $y = x^2 - 3$ and $y = kx + 2$ The range of $A(k)$ is $\left(\frac{10\sqrt{5}}{3}, \infty\right)$ The range of $A(k)$ is $\left(\frac{20\sqrt{5}}{3}, \infty\right)$ If function $\overrightarrow{kA}(k)$ is defined for $k \in [-2, \infty)$, then $A(k)$

is many-one function. The value of k for which area is minimum is 1.

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100.
$$\int (ax^2 + bx + c) dx =$$

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101. Find a continuous function f, where $(x^4 - 4x^2) \leq f(x) \leq (2x^2 - x^3)$ such that the area bounded by $y = f(x), y = x^4 - 4x^2$, the y-axis, and the line x = t, where $(0 \leq t \leq 2)$ is k times the area bounded by $y = f(x), y = 2x^2 - x^3$, y-axis, and line x = t (where $0 \leq t \leq 2$).

102. The parabolas $y^2 = 4xandx^2 = 4y$ divide the square region bounded by the lines x = 4, y = 4 and the coordinate axes. If S_1, S_2, S_3 are the areas of these parts numbered from top to bottom, respectively, then $S_1: S_2 \equiv 1:1$ (b) $S_2: S_3 \equiv 1:2$ $S_1: S_3 \equiv 1:1$ (d) $S_1: (S_1 + S_2) = 1:2$

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103. Statement 1 : The area bounded by parabola $y = x^2 - 4x + 3andy = 0$ is $\frac{4}{3}$ sq. units. Statement 2 : The area bounded by curve $y = f(x) \ge 0andy = 0$ between ordinates x = aandx = b (where b > a) is $\int_a^b f(x)dx$

104. f(x) is a polynomial of degree 3 passing through the origin having local extrema at $x = \pm 2$ Statement 1 : Ratio of areas in which f(x) cuts the circle $x^2 + y^2 = 36is1$: 1. Statement 2 : Both y = f(x) and the circle are symmetric about the origin.

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105.
$$\int x^2 \left(1 - rac{1}{x^2}\right) dx$$
 =

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106. The value of a(a > 0) for which the area bounded by the curves

$$y=rac{x}{6}+rac{1}{x^2},y=0,x=a,andx=2a$$
 has the least value is___

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107. Area bounded by the relation [2x]+[y]=5, x, y>0 is____



108. The area bounded by the curves $y = x(x-3)^2 andy = x$ is_____

(in sq. units)

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109. If the area of the region $\{(x,y): 0\leq y\leq x^2+1, 0\leq y\leq x+1, 0\leq x\leq 2\}$ is A , then the value of 3A-17 is____

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110. The area enclosed by $f(x) = 12 + ax - x^2$ coordinates axes and the ordinates at x = 3(f(3) > 0) is 45 sq. units. If *mandn* are the x-axis intercepts of the graph of y = f(x), then the value of (m + n + a)



drawn from the origin is A, then the value of 3A is_-

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113. If the area enclosed by the curve $y=\sqrt{x}$ and $x=-\sqrt{y}$, the circle $x^2+y^2=2$ above the x-axis is $A,\,$ then the value of $rac{16}{\pi}A$ is____

114. Which of the following abnormalities is due to X-linked recessive

mutation ?



115. If A is the area bounded by the curves $y=\sqrt{1-x^2}$ and $y=x^3-x$

, then of
$$rac{\pi}{A}$$
 .

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116. A curve is given by
$$y = \Big\{ \Big(\sqrt{4-x^2}\Big), 0 \le x < 1 ext{ and } \sqrt{(3x)}, 1 \le x \le 3.$$
 Find the area

lying between the curve and x-axis.

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117. Find the area enclosed by the curves $x^2=y, y=x+2$ and x-axis



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

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119. Find the area of that part of the circle $x^2+\ y^2=16$ which is exterior to the parabola $y^2=6x$

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120. Find the area bounded by the y-axis, $y = \cos x$,and $y = \sin x$ when

$$0 \leq x \leq rac{\pi}{2}$$
 .

121. Find the area lying in the first quadrant and bounded by the curve

$$y=x^{\circ}$$
 and the line $y=4x_{\cdot}$

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122. If the area enclosed by curve $y = f(x)andy = x^2 + 2$ between the abscissa $x = 2andx = \alpha, \alpha > 2$, is $(\alpha^3 - 4\alpha^2 + 8)sq$ unit. It is known that curve y = f(x) lies below the parabola $y = x^2 + 2$.

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123. Plot the region in the first quadrant in which points are nearer to the

origin than to the line x = 3.



124. Find the area bounded by the curve $y = \sin^{-1} x$ and the line $x = 0, \, |y| = rac{\pi}{2}.$

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125. Find the area of the region bounded by the limits $x=0, x=rac{\pi}{2}, and f(x)=\sin x, g(x)=\cos x$

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126. The area bounded by $y = \sec^{-1} x$, $y = \cos ec^{-1} x$, and line x - 1 = 0 is (a) $\log(3 + 2\sqrt{2}) - \frac{\pi}{2}$ sq. units (b) $\frac{\pi}{2} - \log(3 + 2\sqrt{2})$ sq. units (c) $\pi - (\log)_e 3$ sq. units (d) non of these

127. The area of the region whose boundaries are defined by the curves y=

$$2\cos x, y=$$
 3tanx and the y-axis is (a) $1+31niggl(rac{2}{\sqrt{3}}iggr) squarts$ (b)

$$1 + rac{3}{2} 1n3 - 31n2squants$$
 (c) $1 + rac{3}{2} 1n3 - 1n2squants$ (d)

1n3 - 1n2squarts

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128. A particle of mass m is moving anticlockwise, in a circle of radius R in x - y plane with centre at (R, 0) with a constant speed v_2 . If is located at point (2R, 0) at time t = 0. A man starts moving with a velocity v_1 along the positive y-axis from origin at t = 0. Calculate the linear momentum of the particle w.r.t. man as a function of time.

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129. The area of the closed figure bounded by $x = -1, y = 0, y = x^2 + x + 1,$ and the tangent to the curve

$$y=x^2+x+1$$
 at $A(1,3)$ is (a) $rac{4}{3}$ sq. units (b) $rac{7}{3}$ sq. units (c) $rac{7}{6}$ sq.

units (d) non of these

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130. The area of the closed figure bounded by $y = \frac{x^2}{2} - 2x + 2$ and the tangents to it at $\left(1, \frac{1}{2}\right)$ and (4, 2) is (A) $\frac{9}{8}$ sq.unit (B) $\frac{3}{8}$ sq.units (C) $\frac{3}{2}$ sq.units (D) $\frac{9}{4}$ sq.units

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131. The area of the closed figure bounded by x = -1, x = 2, and $y = \{ -x^2 + 2, x \le 12x - 1, x > 1$ and the ascissa axis is (a) $\frac{16}{3}squnits$ (b) $\frac{10}{3}squnits$ (c) $\frac{13}{3}squnits$ (d) $\frac{7}{3}squnits$

132. The area between the curve $y = 2x^4 - x^2$, the axis, and the ordinates of the two minima of the curve is 11/60 sq. units (b) 7/120 sq. units 1/30 sq. units (d) 7/90 sq. units

133. The area bounded by the curve
$$a^2y = x^2(x+a)$$
 and the x-axis is $\frac{a^2}{3}squares inits$ (b) $\frac{a^2}{4}squares inits \frac{3a^2}{4}squares inits$ (d) $\frac{a^2}{12}squares inits$

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

$$x = 4y - 2.$$

135. If S is the sum of cubes of possible value of c for which the area of the figure bounded by the curve $y = 8x^2 - x^5$, then straight lines x = 1 and x = c and the abscissa axis is equal to $\frac{16}{3}$, then the value of [S], where [.] denotest the greatest integer function, is ____

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136. The area of the smaller region bounded by circle $x^2+y^2=1$ and

$$|y|=x+1$$
 (a) $rac{\pi}{2}-rac{1}{2}squants$ (b) $rac{\pi}{2}-1squants$ (c) $rac{\pi}{2}squants$ (d) $rac{\pi}{2}+1squants$

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137.
$$\int \! rac{e^{2x}-1}{e^{2x}+1} dx$$
 is eual to -

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

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139. Find the area of the region bounded by the x-axis and the curves

defined by
$$y = an x \left(where - rac{\pi}{3} \le x \le rac{\pi}{3}
ight)$$
 and $y = an x \left(where rac{\pi}{6} \le x \le rac{3x}{2}
ight).$

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

141. Given
$$A = \begin{bmatrix} 5 & 0 & 4 \\ 2 & 3 & 2 \\ 1 & 2 & 1 \end{bmatrix}$$
, $B^{-1} = \begin{bmatrix} 1 & 3 & 3 \\ 1 & 4 & 3 \\ 1 & 3 & 4 \end{bmatrix}$. Compute $(AB)^{-1}$. Watch Video Solution

142. Find the area bounded by the curves $x^2+y^2=25, 4y=\left|4-x^2
ight|,$

and x = 0 above the x-axis.