MATHS

BOOKS - MARVEL MATHS (HINGLISH)

APPLICATIONS OF DEFINITE INTEGRALS

Multiple Choice Questions Part A Building Up The Base

1. $y = x^2 + 1, \ldots . x = 0, x = 3$

A. 12

B. 21

C. 18

D. 9

Answer: A

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2. $y = \frac{3}{x^2}, \ldots\ldots x = 1, x = 2$

A. 32

B. 23

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

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

Answer: C

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3. $y = 4 - x^2, \ldots . x = 0, x = 1$

A. 33

B. $\frac{11}{3}$

C. 3.3

D. $\frac{3}{11}$

Answer: B

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4. $y = 3 - 2x - x^2, \ldots x = -1, x = 2$

A. 9

B. 3

C. 25

D. 36

Answer: B

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5. $y = (x-1)(2-x), \ldots . x = 1, x = 2$

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

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

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

D. $\frac{1}{6}$

Answer: D

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6. $y = \sin x, \ldots\ldots x = 0, x = \frac{2\pi}{3}$

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

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

C. 1

D. 2

Answer: B

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7. $y = x + \sin x, \ldots . x = 0, x = \frac{\pi}{2}$

A. $\frac{\pi}{4} + 1$

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

C. $\frac{\pi^2}{4} + 1$

D. $\frac{\pi^2}{8} + 1$

Answer: D

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8. $y = \sin^2 x, \ldots\ldots x = 0, x = \frac{\pi}{4}$

A. $\frac{\pi}{8} - \frac{1}{4}$

B. $\frac{\pi}{4} - \frac{1}{8}$

C. $\frac{\pi}{32}$

D. $\frac{1}{2} + \frac{\pi}{4}$

Answer: A

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9. $xy = c^2, \ldots . x = c, x = 2c$ where c>0

A. $2c^2$

B. $c^2 . \log 2$

C. $2c . \log 32$

D. $c^2 . \log 4$

Answer: B

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10. If $f(x) = 3x^2, \quad \text{if } 0 \leq x \leq 2$
$= 16 - 2x, \quad \text{if } x \geq 2,$

then area bounded by the graph of $y = f(x)$, the X-axis and the line x = 3 is (in sq. u.)

A. 12

B. 19

C. 17

D. 24

Answer: B

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11. Area under the curve $x = at^2, y = 2at$ from x = 0 to x = a is

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

B. $\frac{4a}{3}$

C. $\frac{3a}{4}$

D. $\frac{3a^2}{4}$

Answer: A

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12. Area in the first quadrant bounded by the hyperbola $9x^2 - y^2 = 36$, the X-axis and the lines x = 2, x = 4 is

A. $6\sqrt{3}$

B. $\log\left(3 + \sqrt{2}\right)$

C. $6\sqrt{3} - 3\log\left(2 + \sqrt{3}\right)$

D. None of these

Answer: D

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13. Area bounded by the curve $y = x^2 - 2x$ and the line y = 2x is

A. $\frac{125}{6}$

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

C. 36

D. 28

Answer: B

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14. Area of the region between the curve $y = x^2 - 3x$ and the line y = 2x is

A. $\frac{125}{6}$

B. $\frac{49}{3}$

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

D. $\frac{67}{3}$

Answer: A

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15. Area of the region bounded by the parabola $ay = x^2$, the X-axis and the ordinates at x = a, x = 2a is

A. $\frac{3a^2}{7}$

B. $\frac{3a}{7}$

C. $\frac{7a}{3}$

D. $\frac{7a^2}{3}$

Answer: D

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16. Area bounded by the parabola $ay^2 = x$, the X-axis and the ordinate at x = a is

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

B. $\frac{2a}{3}$

C. $\frac{a^2}{2}$

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

Answer: B

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17. Area enclosed between the curve $ay = 3\left(a^2 - x^2\right)$ and the X-axis is

A. $4a^2$

B. 8a

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

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

Answer: A

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18. Area enclosed between the curve $y = x^2$ and the line y = x is

A. $\frac{1}{8}$

B. $\frac{1}{6}$

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

D. $\frac{1}{7}$

Answer: B

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19. Area bounded between the curve $x^2 = y$ and the line y = 4x is

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

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

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

D. $\frac{1}{7}$

Answer: A

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20. Area enclosed between the curve $y^2 = x$ and the line y = x is

A. 1

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

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

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

Answer: C

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21. The area bounded by the parabola $y^2 = 8x,$ the x-axis and the latusrectum, is

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

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

C. $\frac{23}{3}$

D. $\frac{22}{3}$

Answer: B

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22. Area enclosed between the curve $y^2 = 16x$ and the chord BC, where $B \equiv (1, 4)$ and $C \equiv (9, 12)$ is

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

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

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

D. None of these

Answer: C

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23. Area of the region enclosed between the curve $x = 1 - y^2$ and the Y-axis is

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

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

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

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

Answer: B

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24. Area enclosed between the curve $x = 2y - y^2$ and the Y-axis is

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

B. $\frac{5}{3}$

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

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

Answer: A

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25. Area enclosed between the curve $x^2 + 4y = 4$ and the X-axis is

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

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

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

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

Answer: A

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26. Area enclosed between the curve $y = x^2 - 5x + 15$ and the line $y = 3x + 3$ is

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

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

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

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

Answer: A

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27. Area of the portion of the parabola $y^2 = 4ax$ included between the X-axis, the ordinate at x = 2a and its latus rectum is

A. $\frac{a^2\left(2\sqrt{2}-1\right)}{3}$

B. $\frac{4a^2\left(2\sqrt{2}-1\right)}{3}$

C. $\frac{8a^2\left(2\sqrt{2}-1\right)}{3}$

D. None of these

Answer: D

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28. If the area of the region enclosed between the curve $y = 3x^2 - 4x + c$, the X-axis and the ordinates at x = 1, x = 3 is 20, then : c =

A. 0

B. 3

C. 5

D. None of these

Answer: C

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29. Area above the X-axis, bounded by the circle $x^2 + y^2 - 2ax = 0$ and the parabola $y^2 = ax$ is

A. $a^2\left(\frac{\pi}{4} - \frac{2}{3}\right)$

B. $a^2\left(\frac{\pi}{4} + \frac{2}{3}\right)$

C. $2a^2\left(\frac{\pi}{4} + \frac{2}{3}\right)$

D. None of these

Answer: A

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30. The area bounded by the curves $y = \sin x$, y= cos x and y-axis in 1st quadrant is -

A. $3\sqrt{2} - 1$

B. 2

C. $2 - \sqrt{2}$

D. $\sqrt{2} - 1$

Answer: C

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

A. $\frac{16a^2}{3}$

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

C. $\frac{4a^2}{3}$

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

Answer: A

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32. If the area bounded by the parabola $x^2 = y$ and the line y = 4 is divided into equal parts by the line y = c, then : c =

A. 1

B. $\sqrt[3]{4}$

C. $\sqrt[3]{8}$

D. $\sqrt[3]{16}$

Answer: D

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

A. $\frac{a^2}{2}\left(\frac{\pi}{2} + 1\right)$

B. $\frac{a^2}{2}\left(\frac{\pi}{2} - 1\right)$

C. $a^2\left(\frac{\pi}{2} - 1\right)$

D. $a^2(\pi - 1)$

Answer: B

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

A. $\frac{a^2}{4}(\pi - 2)$

B. $\frac{a^2}{4}(\pi + 2)$

C. $\frac{a^2}{4}(2 - \pi)$

D. $\frac{a^2}{4}(\pi - 2)$

Answer: A

35. Find the area of one of the curvilinear triangles formed by the curves $y = \sin x, x = \cos^{-1} y$ and the x-axis.

A. $2 + \sqrt{2}$

B. $2 - \sqrt{2}$

C. $2 + 2\sqrt{2}$

D. $2\sqrt{2}$

Answer: B

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36. Area of smaller part in the first quadrant bounded by the semi-circle $y = \sqrt{4 - x^2}$, the line $y = x\sqrt{3}$ and X -axis, is

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

B. $\frac{2\pi}{3}$

C. $\frac{4\pi}{3}$

D. 4π

Answer: B

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37. If $f(x) = x^2, \quad \text{if } 0 \leq x \leq 1$
$= \sqrt{x}, \quad \text{if } x \geq 1,$

then area above X-axis, bounded by the line x = 4 and the curve y = f(x) is

A. 1

B. 2

C. 5

D. None of these

Answer: C

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38. Area bounded by the parabolas $y = 4x^2$, $9y = x^2$ and the line $y = 2$ is

A. $\frac{20\sqrt{2}}{3}$

B. $\frac{10\sqrt{2}}{3}$

C. $\frac{40\sqrt{2}}{3}$

D. None of these

Answer: A

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39. Indicate the region bounded by the curves $y = x^2, y = x + 2$ and x-axis and obtain the area enclosed by them

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

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

C. $\frac{5}{6}$

D. $\frac{5}{8}$

Answer: C

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40. The area bounded by the curve $y = 2x - x^2$ and the line y = - x is

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

B. $\frac{43}{6}$

C. $\frac{35}{6}$

D. π^2

Answer: A

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41. The area of bounded by the curve $y = \log x,$ the x-axis and the line $x = e$ is

A. 4

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

C. 1

D. $\frac{1}{e}$

Answer: C

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42. x=0 एवं $x = 2\pi$ के मध्य वक्र $y = \cos x$ से घिरे क्षेत्र का क्षेत्रफल ज्ञात कीजिए |

A. 2

B. 4

C. 6

D. 8

Answer: D

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43. Area bounded by the semi-sircle $y = \sqrt{4 - x^2}$, and its diameter y = 0, is

A. 2π

B. π

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

D. $2\pi^2$

Answer: A

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44. The area of the figure bounded by right of the line $y = x + 1, y = \cos x$ and x-axis is :

A. 1

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

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

D. $\frac{5}{2}$

Answer: C

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

A. 2

B. 4

C. 8

D. 16

Answer: A

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46. Area of the region bounded by the curves y = tan x, y = cot x and X-axis in $0 \leq x \leq \frac{\pi}{2}$ is

A. 3 log 2

B. log 2

C. 2 log 2

D. $\frac{\pi}{8}$ log 2

Answer: B

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47. What is the area bounded by the curves $y = e^x, y = e^{-x}$ and the straight line $x = 1$?

A. $e + \frac{1}{e} + 2$

B. $e + \frac{1}{e} - 2$

C. $e - \frac{1}{e} + 2$

D. $e - \frac{1}{e} - 2$

Answer: B

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48. The area bounded by the curve $x = 2 - y - y^2$ and Y-axis is

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

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

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

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

Answer: A

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49. The area bounded by the curves $y = \sin x$, $y = \cos x$ and y-axis in 1 quadrant is -

A. 1

B. 2

C. 3

D. 4

Answer: C

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50. Find the area of the region enclosed by the curves $y = x \log x and y = 2x - 2x^2.$

A. $\frac{7}{12}$

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

C. $\frac{5}{12}$

D. $\frac{5}{2}$

Answer: A

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51. The slope of the tangent to a curve $y = f(x)$ at $(x, f(x))$ is $2x + 1$. If the curve passes through the point $(1, 2)$ then the area of the region bounded by the curve, the x-axis and the line $x = 1$ is (A) $\frac{5}{6}$ (B) $\frac{6}{5}$ (C) $\frac{1}{6}$ (D) 1

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

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

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

D. 6

Answer: A

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52. The area (in square units) bounded by the curve $y^2 = 8x$ and $x^2 = 8y$, is

A. $\frac{32}{7}$

B. $\frac{24}{7}$

C. $\frac{72}{7}$

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

Answer: D

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53. Area bounded by the curves $y = x - x^2$ and X-axis, between Y-axis and the line $x = 1$, is

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

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

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

D. $\frac{1}{6}$

Answer: D

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54. The area bounded by the x-axis and the curve $y = 4x - x^2 - 3$ is

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

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

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

D. 7

Answer: C

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55. Area bounded by the $xy^2 = 1$, X-axis and the lines x = 1, x = 2 is

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

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

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

D. $2\left(\sqrt{2}+1\right)$

Answer: A

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

A. $\sqrt{2}$

B. $2\sqrt{2}$

C. $3\sqrt{2}$

D. $4\sqrt{2}$

Answer: B

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57. If a curve $y = a\sqrt{x} + bx$ passes through the point (1,2) and the area 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: B

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58. If the area bounded by the curve $y = x^2$, the X-axis and the line $x = 2^{1/3}$ is divided into two equal parts by the line x = a, then : a=

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

B. 1

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

D. $3^{1/3}$

Answer: B

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59. 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 $\frac{x}{a} + \frac{y}{b} = 1$

A. $\frac{1}{2}\pi ab$

B. $\frac{1}{2}ab$

C. $\frac{1}{4}\pi ab - \frac{1}{2}ab$

D. $\frac{1}{4}ab - \frac{\pi}{4}$

Answer: C

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60. Area enclosed by the curve $x^2y = 36$, the X-axis and the lines x = 6 and x = 9, is

A. 2

B. 1

C. 4

D. None of these

Answer: A

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61. If $a < b$, then area under the curve $xy = c^2$, the X-axis and the ordinates at a and b is

A. $c^2 . \log\left(\frac{a}{b}\right)$

B. $c^2 . \log\left(\frac{b}{a}\right)$

C. $c^2 . \log(ab)$

D. None of these

Answer: B

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62. The ratio of the areas between the curves $y = \cos x$ and $y = \cos 2x$ and x-axis from $x = 0$ to $x = \frac{\pi}{3}$ is

A. $1:2$

B. $2:1$

C. $\sqrt{3}:1$

D. $1:\sqrt{3}$

Answer: B

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63. If the area above the x-axis, bounded by the curves $y = 2^{kx}$ and x = 0, and x = 2 is $\frac{3}{\log_e(2)}$, then the value of k is

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

B. 1

C. -1

D. 2

Answer: B

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64. Area bounded by the curve $y = 2 + x, y = 2 - x$ and x = 2 is

A. 3

B. 4

C. 8

D. None of these

Answer: B

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65. Area under the line $4x - y + 2 = 0$, above the X-axis, bounded by the lines x = 0 and x = 3 is (in sq. units)

A. 12

B. 24

C. 25

D. None of these

Answer: B

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66. Area bounded by the line $2x + y = 4$, the X-axis and the ordinate at $x = -2$ is

A. 12

B. 15

C. 16

D. None of these

Answer: C

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67. Area above the X-axis, bounded by the parabola $y^2 = 9x$ from $x = 0$ to $x = 3$ is

A. $3\sqrt{6}$

B. $6\sqrt{3}$

C. $10\sqrt{3}$

D. None of these

Answer: B

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68. Area bounded by the parabola $x^2 = -4y$, the X-axis and the lines x = 0, x = 4 is

A. $\frac{16}{3}$

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

C. 8

D. 6

Answer: A

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69. Area bounded by parabola $x^2 = y$, the Y-axis and the lines y = 0, y = 4 is

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

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

C. 6

D. 8

Answer: B

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70. Area bounded by the parabola $x^2 = 16y$ and the line $x - 2y = 0$ is

A. $\frac{16}{3}$

B. 6

C. 10

D. None of these

Answer: A

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71. Area bounded by the curve $y = x^2 + x - 6$ and the X-axis is

A. $\frac{127}{6}$

B. $\frac{225}{6}$

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

D. None of these

Answer: C

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72. Area bounded by the lines $x = 2y, y = 2x$ and x = 4 is

A. 14

B. 13

C. 10

D. 12

Answer: D

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73. Area bounded by the lines $y = 2x, y = 4x$ and x = 2 is

A. 8

B. 4

C. 5

D. None of these

Answer: B

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74. Area bounded by the parabola $3y = x^2$, the X-axis and the lines x = 2, x = 3 is

A. $\frac{29}{9}$

B. $\frac{17}{9}$

C. $\frac{7}{9}$

D. $\frac{19}{9}$

Answer: D

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75. Area between the parabolas $y^2 = px$ and $x^2 = qy$ is

A. $\frac{16pq}{3}$

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

C. $15pq$

D. $2pq$

Answer: B

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76. FInd the area bounded by the curves $y^2 = 9x$ and $x^2 = 9y$.

A. 36

B. 18

C. 27

D. 6

Answer: C

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77. Area between the parabola $y^2 = x$ and the line x = 3 is

A. $4\sqrt{3}$

B. $2\sqrt{3}$

C. $6\sqrt{3}$

D. $5\sqrt{3}$

Answer: A

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78. x=0 एवं $x = 2\pi$ के मध्य वक्र $y = \cos x$ से घिरे क्षेत्र का क्षेत्रफल ज्ञात कीजिए |

A. 2

B. 4

C. 3

D. 5

Answer: B

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79. Area bounded by the curve $xy = x + 4$, the X-axis and the lines x = 1, x = 4 is

A. $3 + 5 \log 4$

B. $4 + 4 \log 4$

C. $3 + 4 \log 4$

D. $3 + 3 \log 4$

Answer: C

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80. Area bounded by the curve $xy = 16$, the X-axis and the lines $x = 2$, $x = 4$ is

A. $2 + 4 \log 3$

B. $8 \log 2$

C. $16 \log 2$

D. $4 \log 2$

Answer: C

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81. Area enclosed by the curve $y = \sin^2 x$, the X-axis and the lines $x = 0, x = \pi / 2$ is

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

B. 1

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

D. None of these

Answer: C

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82. Area under the curve $y = x\sin x^2$, bounded by the lines x = 0 and $x = \sqrt{\pi/2}$ is

A. 0.3

B. 0.4

C. 0.5

D. 1

Answer: C

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83. Area bounded by the parabola $x^2 = 4y$ and its latusrectum is

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

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

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

D. $\frac{5}{3}$

Answer: B

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84. If the area enclosed between the parabola $y^2 = 4x$ and the line y = mx is (1/3) sq. unit, then : m =

A. 1

B. 2

C. 3

D. 4

Answer: B

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85. If the area bounded by the parabola $y^2 = 4ax$ and the line y=mx is $\frac{a^2}{12}$ sq. units, by

using integration find the value of m.

A. 1

B. 2

C. 3

D. 4

Answer: D

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86. Area bounded by the curve $y = (x-1)(x-5)$ and the X-axis is

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

B. $\frac{31}{3}$

C. $\frac{29}{3}$

D. $\frac{28}{3}$

Answer: A

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87. Area of the region bounded by the curve $y = x^2 - 5x + 4$ and the X-axis is

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

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

C. $\frac{7}{2}$

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

Answer: D

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88. If the area enclosed between the curves $y = ax^2 and x = ay^2 (a > 0)$ is 1 square unit, then find the value of a.

A. 3

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

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

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

Answer: B

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89. If the area bounded by the curves $y = x - x^2$ and line $y = mx$ is equal to $\frac{9}{2}$ sq.units , then m may be

A. -4

B. -2

C. 2

D. 4

Answer: D

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90. The area of bounded by the curve $y = \log x,$ the x-axis and the line $x = e$ is

A. e

B. 1

C. $1 - \frac{1}{e}$

D. $1 + \frac{1}{e}$

Answer: B

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91. Area under the curve $y = \sqrt{16 - x^2}$ between x = 0 and x = 4 in the first quadrant is

A. 8π

B. 16π

C. 4π

D. $\frac{8\pi}{3}$

Answer: C

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92. Area bounded by the curve y = log x, the X-axis and the line x = 1, x = 3 is

A. 2 + log 27

B. $-2+$ log 9

C. $-2+$ log 27

D. log 18

Answer: C

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93. Area bounded by the curve $y = \log x$, the X-axis and the lines $x = e, x = 2e$ is

A. e

B. log 2

C. e . log 2

D. 2e . log 2

Answer: D

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94. Area bounded by the curve $y = \sin^{-1} x$, the X-axis and the line 2x = 1 is

A. $\frac{\pi}{12} + \frac{\sqrt{3}}{2}$

B. $\frac{\pi}{12} - \frac{\sqrt{3}}{2}$

C. $\frac{\pi}{12} - 1$

D. $\frac{\pi}{12} + \frac{\sqrt{3}}{2} - 1$

Answer: D

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95. Area bounded by the curve $y = \tan^{-1} x$, the X-axis and the line x = 1 is

A. $\frac{\pi}{4} + \log \sqrt{2}$

B. $\frac{\pi}{4} - \sqrt{2}$

C. $\frac{\pi}{4} - \log \sqrt{2}$

D. $\frac{\pi}{2} - \log \sqrt{2}$

Answer: C

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96. Area bounded by the curve $y = e^x$, the X-axis and the lines x = 0, x = 2 is

A. $e^2 + 1$

B. $e - 1$

C. 2e

D. $e^2 - 1$

Answer: D

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97. Area bounded by the curve $y = e^{-x}$, the X-axis and the lines x = 0, x = 1 is

A. $1 + \frac{1}{e}$

B. $1 - \frac{1}{e}$

C. $e + 1$

D. $e - 1$

Answer: B

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98. Area bounded by the curve

$$y = x^2, \quad \text{if} \quad x < 0$$
$$= 2x, \ \text{if} \quad x \geq 0,$$

and the line y = 9 is

A. $\frac{155}{4}$

B. $\frac{153}{4}$

C. $\frac{151}{4}$

D. None of these

Answer: B

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Multiple Choice Questions Part B Mastering The Best

1. The area bounded by the curve $y = 2x - x^2$ and the line y = - x is

A. $\frac{9}{2}$ sq. units

B. $\frac{43}{6}$ sq. units

C. $\frac{35}{6}$ sq. units

D. none of these

Answer: A

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2. The parabolas $y^2 = 4x$ and $x^2 = 4y$ 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

A. $S_1 : S_2 \equiv 1 : 1$

B. $S_2 : S_3 \equiv 1 : 2$

C. $S_1 : S_3 \equiv 1 : 1$

D. $S_1 : (S_1 + S_2) = 1 : 2$

Answer: A

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3. The area (in sqaure units) of the region enclosed by the curves $y = x, x = 2, y = \frac{1}{x}$ and the positive x-axis is

A. 1 sq. unit

B. $\frac{3}{2}$ sq. unit

C. $\frac{5}{2}$ sq. unit

D. $\frac{1}{2}$ sq. unit

Answer: B

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

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

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

C. $\frac{8}{9}$

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

Answer: D

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

A. $\sqrt{2}$

B. 2

C. $2\sqrt{2}$

D. none of these

Answer: C

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6. The area bounded by the curves $y = f(x)$, the x-axis, and the ordinates $x = 1 and x = b$ is $(b-1)\sin(3b+4)$. Then $f(x)$ is.

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

$\sin(3x+4)+3(x-1)\cos(3x+4)$ None of these

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

B. $\sin(3x+4)$

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

D. none of these

Answer: C

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7. 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

$\sqrt{x-1}$ (b) $\sqrt{x+1}\sqrt{x^2+1}$ (d) $\frac{x}{\sqrt{1+x^2}}$

A. $\sqrt{x-1}$

B. $\sqrt{x+1}$

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

D. $\frac{x}{\sqrt{1+x^2}}$

Answer: D

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8. If $y = f(x)$ makes positive intercepts of 2 and 1 unit on x and y-coordinates axes and encloses an area of $\frac{3}{4}$ sq unit with the axes, then $\int_0^2 x f'(x)\, dx$, is

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

B. 1

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

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

Answer: D

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Multiple Choice Questions Previous Years Mht Cet Exam Questions

1. the area formed by the lines $x^2 - y^2 = 0$ and $x + 8 = 0$ is

A. 16

B. 32

C. 64

D. 128

Answer: C

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2. Find the area included between the line $y = x$ and the parabola $x^2 = 4y$.

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

B. $\frac{23}{3}$ sq. units

C. $\frac{29}{3}$ sq. units

D. $\frac{31}{3}$ sq. units

Answer: A

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Test Your Grasp

1. $y = \frac{3}{x^2}, \ldots\ldots x = 1, x = 2$

A. 32

B. 23

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

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

Answer: C

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2. $y = (x-1)(2-x), \ldots\ldots x = 1, x = 2$

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

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

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

D. $\frac{1}{6}$

Answer: D

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3. $y = x + \sin x, \ldots . x = 0, x = \frac{\pi}{2}$

A. $\frac{\pi}{4} + 1$

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

C. $\frac{\pi^2}{4} + 1$

D. $\frac{\pi^2}{8} + 1$

Answer: D

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4. $y = \sin^2 x, \ldots\ldots x = 0, x = \frac{\pi}{4}$

A. $\frac{\pi}{8} - \frac{1}{4}$

B. $\frac{\pi}{4} - \frac{1}{8}$

C. $\frac{\pi}{32}$

D. $\frac{1}{2} + \frac{\pi}{4}$

Answer: A

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5. $xy = c^2, \ldots . x = c, x = 2c$

A. $2c^2$

B. $c^2 . \log 2$

C. $2x . \log 2$

D. $c^2 . \log 4$

Answer: B

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6. If $f(x) = 3x^2, \quad \text{if } 0 \leq x \leq 2$
$= 16 - 2x, \quad \text{if } x \geq 2,$

then area bounded by the graph of $y = f(x)$, the X-axis and the line x = 3 is (in sq. u.)

A. 12

B. 19

C. 17

D. 24

Answer: B

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7. Area enclosed between the curve $y^2 = x$ and the line y = x is

A. 1

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

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

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

Answer: C

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8. The area bounded by the parabola $y^2 = 8x,$ the x-axis and the latusrectum, is

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

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

C. $\frac{23}{3}$

D. $\frac{22}{3}$

Answer: B

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9. If the area of the region enclosed between the curve $y = 3x^2 - 4x + c$, the X-axis and the ordinates at x = 1, x = 3 is 20, then : c =

A. 0

B. 3

C. 7

D. 5

Answer: D

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10. The area bounded by the curve $x = 2 - y - y^2$ and Y-axis is

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

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

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

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

Answer: A

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11. Area bounded by the curves $y = x - x^2$ and X-axis, between Y-axis and the line x = 1, is

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