MATHS

BOOKS - HIMALAYA MATHS (KANNADA ENGLISH)

Definite Integrals and its Application

QUESTION BANK

1. $\int_0^{\frac{3}{2}} \sin^3 x dx =$

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

B. 44228

C. 44257

D. 1

Answer: C

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2. $\int_0^{\frac{\pi}{2}} \frac{\tan^{-1} x}{1+x^2} dx =$

A. $\frac{\pi^2}{4}$

B. $\frac{\pi^2}{16}$

C. $\frac{\pi^2}{32}$

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

Answer: C

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3. $\int_{\sqrt{8}}^{\sqrt{15}} x\sqrt{1+x^2} dx =$

A. 44423

B. 37/3

C. 37/6

D. 15/16

Answer: B

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4. $\int_0^{2\pi} \sqrt{1+\sin\left(\frac{x}{2}\right)}dx =$

A. 0

B. 2

C. minus 8

D. 8

Answer: D

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5. $\int_0^{\frac{\pi}{2}} \frac{\sin^2 x}{(1+\cos x)^2}dx =$

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

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

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

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

Answer: B

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6. $\int_0^a \frac{x-a}{x+a}dx =$

A. a+ 2a log 2

B. a- 2a log 2

C. 2a log 2

D. 2a log 1/2

Answer: B

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7. $\int_0^1 \frac{dx}{1+x^2} dx =$

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

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

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

D. none of these

Answer: C

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8. $\int_1^4 \frac{1}{1+\sqrt{x}} dx =$

A. 4 +2 log 3

B. 4- log 3

C. 4- log 9

D. 4-2 log 3

Answer: C

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9. $\int_0^{\frac{\pi}{2}} e^x \left(\frac{1+\sin x}{1+\cos x} \right) dx =$

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

B. 0

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

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

Answer: C

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10. $\int_2^e \left[\frac{1}{\log x} - \frac{1}{(\log x)^2} \right] dx$

A. e-2

B. $e + 2\log_2 e$

C. $e - 2\log_2 e$

D. none of these

Answer: C

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11. $\int_0^1 \frac{xe^x}{(1+x)^2} dx =$

A. e-2

B. 1/2 (e+2)

C. 1/2 (e-2)

D. e+2

Answer: C

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12. $\int_0^1 (x-1)e^{-x}dx =$

A. 0

B. e

C. 1/e

D. minus 1/e

Answer: D

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13. $\int_{-1}^{1} \frac{x^2 \sin^{-1} x}{\sqrt{1-x^2}} dx$

A. 0

B. 2

C. π

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

Answer: A

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14. $\int_{-1}^{1} \frac{x \sin^{-1} x}{\sqrt{1-x^2}} dx$

A. 0

B. 2

C. π

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

Answer: B

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15. $\int_{0}^{1} \frac{xdx}{\left(x+\sqrt{((1-x^2))}\right)\sqrt{(1-x^2)}} dx =$

A. 0

B. 1

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

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

Answer: C

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16. $\int_0^1 \frac{dx}{(x^2+1)^{3/2}} dx$ is equal to :

A. 44228

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

C. 1

D. $\sqrt{2}$

Answer: B

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17. $\int_0^1 \frac{dx}{e^x + e^{-x}}$ is equal to

A. $\tan^{-1} e$

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

C. $\tan^{-1} e - \frac{\pi}{4}$

D. $\tan^{-1} e + \frac{\pi}{4}$

Answer: C

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18. $\int \frac{\log(x^2)}{x} dx =$

A. $(\log x)^2$

B. $-\left(\log x^2\right)$

C. $\frac{(\log x)^2}{2}$

D. none of these

Answer: A

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19. $\int_0^{\frac{\pi}{4}} \frac{e^{\tan x}}{\cos^2 x} dx =$

A. e-1

B. e

C. $e^2 - 1$

D. $e^{-2} - 1$

Answer: A

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20. $\int_1^2 (\log x) dx =$

A. $\log 2$

B. $(\log 2)^2$

C. $\log 4 - 1$

D. none of these

Answer: C

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21. $\int_0^{\infty} xe^{-x}dx =$

A. 1

B. 0

C. -1

D. none of these

Answer: A

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22. $\int_1^4 x\sqrt{x}dx =$

A. 12.4

B. 8.4

C. 8.8

D. 12.8

Answer: A

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23. $\int_0^{\log 5} e^x \frac{\sqrt{e^x-1}}{e^x+3}dx =$

A. $3+2\pi$

B. $4-\pi$

C. $2+\pi$

D. $4 + \pi$

Answer: B

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24. $\int_0^{\frac{\pi}{2}} \sin 2x . \log(\tan x) dx =$

A. 2

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

C. 0

D. none

Answer: C

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25. $\int_0^{\pi/4} \frac{\sin x + \cos x}{3 + \sin 2x} dx =$

A. minus 1/4 log 3

B. 1/2 log 3

C. 1/4 log 3

D. minus 1/2 log 3

Answer: C

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26. $\int_0^{\frac{\pi}{2}} \cos^5\left(\frac{x}{2}\right).\sin x dx =$

A. $\frac{2}{7}\left(1-\frac{1}{8\sqrt{2}}\right)$

B. $-\frac{4}{7}\left(1-\frac{1}{8\sqrt{2}}\right)$

C. $\frac{4}{7}\left(1-\frac{1}{8\sqrt{2}}\right)$

D. $-\frac{2}{7}\left(1-\frac{1}{8\sqrt{2}}\right)$

Answer: C

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27. $\int_{-1}^{1} x^n(1-x)dx$, when n is even =

A. 2/(n+1)

B. 1/(n+1)

C. 2/((n+1)(n+2))

D. 2/(n+2)

Answer: A

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28. $\int_{0}^{1} x(1-x)^9 dx =$

A. 44470

B. 44501

C. 1/110

D. 2/110

Answer: C

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29. $\int_{-1}^{1} x^3((1-x^2)dx$

A. 0

B. 44267

C. 3

D. 1

Answer: A

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30. $\int_{0}^{\frac{\pi}{4}} \tan^2 x dx$

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

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

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

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

Answer: B

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31. $\int_1^e \log x dx =$

A. 0

B. 1

C. e-1

D. e+2

Answer: B

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32. $\int_0^{\frac{\pi}{2}} \sin^2 x dx =$

A. π

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

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

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

Answer: D

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33. $\int_0^{\pi} \sin\left(\frac{x}{2}\right).\cos\left(\frac{x}{2}\right) dx =$

A. 1

B. 0

C. 3

D. minus 4

Answer: A

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34. $\int_0^{\pi} \sqrt{x} dx =$

A. 52/3

B. 19/54

C. 52/2

D. none of these

Answer: D

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35. $\int_0^{\frac{\pi}{4}} \frac{\sqrt{\tan x}}{\sin x \cos x} dx =$

A. 1

B. 2

C. 0

D. 4

Answer: B

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36. $\int_1^e x^n \log x dx$

A. $\frac{e^{n+1}+1}{(n+1)^2}$

B. $\frac{ne^{n+1}+1}{(n+1)^2}$

C. $\frac{ne^{n+1}-1}{(n+1)^2}$

D. $\frac{e^{n+1}-1}{(n+1)^2}$

Answer: B

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37. $\int_0^1 x^2 . e^x dx =$

A. e-2

B. e+2

C. $e^2 - 2$

D. none of these

Answer: A

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38. $\int_0^{\frac{\pi}{2}} e^{\sin x} . \sin 2x dx =$

A. 2

B. $2\sqrt{2}$

C. $\sqrt{2}$

D. minus 4

Answer: A

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39. $\int_{-1}^{1}(x+1)e^{x}dx$

A. cosh 1

B. sinh 1

C. 2 cosh 1

D. none of these

Answer: C

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40. $\int_{-1}^{1}xe^{x}dx=$

A. 2/e

B. $\frac{e^2}{2}$

C. e

D. none of these

Answer: A

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41. $\int_0^{\frac{\pi}{3}} \tan x dx =$

A. log 2

B. 0

C. 1

D. 1-log2

Answer: A

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42. $\int_0^1 \tanh x dx =$

A. $\log\left(e + \frac{1}{e}\right)$

B. $\log\left(e - \frac{1}{e}\right)$

C. $\log\left(\frac{e}{2} + \frac{1}{2e}\right)$

D. $\log\left(\frac{1}{e} - e\right)$

Answer: C

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43. $\int_0^{\log 2} \sinh 2x dx =$

A. $e^{2\log 2} - 1$

B. 2 log 2-1

C. 9/16

D. 16/9

Answer: C

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44. $\int_0^{\infty} e^{-x\log 2} dx =$

A. 0

B. ∞

C. $\log_2 e$

D. none of these

Answer: C

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45. $\int_0^{\infty} xe^{-x^2} dx =$

A. 0

B. ∞

C. 44228

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

Answer: C

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46. $\int_0^{\infty} x^3 . e^{-x^2} dx =$

A. minus 1/2

B. ∞

C. 1

D. 1/2

Answer: D

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47. $\int_0^1 \frac{\left(\sin^{-1} x\right)^2}{\sqrt{1-x^2}} dx =$

A. $\frac{\pi^3}{24}$

B. $\frac{\pi^2}{24}$

C. $\frac{\pi^3}{12}$

D. $\frac{\pi^2}{12}$

Answer: A

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48. $\int_0^2 \frac{1}{4+x^2} dx =$

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

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

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

D. $\frac{\pi}{16}$

Answer: C

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49. $\int_0^3 \frac{dx}{\sqrt{9-x^2}} =$

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

B. $-\frac{\pi}{6}$

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

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

Answer: C

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50. $\int_0^4 \frac{dx}{\sqrt{16-x^2}} =$

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

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

C. π

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

Answer: A

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51. $\int_0^3 \frac{dx}{x^2+9} =$

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

B. $\frac{\pi}{12}$

C. 44287

D. 44531

Answer: B

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52. $\int_{\frac{1}{2}}^{\frac{1}{\sqrt{2}}} \frac{dx}{x^2\sqrt{1-x^2}} =$

A. $\sqrt{3}$

B. $1-\sqrt{3}$

C. $\sqrt{3}-1$

D. 1

Answer: C

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53. $\int_0^{\frac{\pi}{2}} \frac{\sin^3 x}{\cos^3 x + \sin^3 x} dx =$

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

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

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

D. none of these

Answer: B

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54. The value of the integral $\int_0^{\pi} \frac{x \sin^{2n} x}{\sin^{2n} x + \cos^{2n} x} dx$ is :

A. π^2

B. π

C. 2π

D. 3π

Answer: A

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55. $\int_0^{\pi} \frac{x \tan x dx}{\sec x + \cos x} =$

A. $\frac{\pi^2}{4}$

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

C. $\frac{(3\pi)^2}{2}$

D. $\frac{(\pi)^2}{3}$

Answer: A

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56. $\int_0^{2\pi} \sqrt{\frac{1-\cos 2x}{2}} dx =$

A. 2

B. minus 2

C. 4

D. minus 4

Answer: C

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57. $\int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} \left(\frac{\sqrt{1+\cos 2x}}{\sqrt{2}} \right) dx =$

A. 0

B. 1

C. 2

D. minus 2

Answer: C

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58. $\int_{0}^{\pi} \left(\frac{\sqrt{1+\cos 2x}}{\sqrt{2}} \right) dx =$

A. minus 2

B. 2

C. 0

D. minus 3

Answer: B

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59. $\int_0^{\frac{\pi}{2}} \log|\tan x + \cot x| dx =$

A. $\pi \log 2$

B. $-\pi \log 2$

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

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

Answer: A

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60. $\int_0^{\pi/2} |\sin x - \cos x| dx$ is equal to

A. 0

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

C. $\sqrt{2}-1$

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

Answer: B

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61. $\int_{-1}^{1}|1-x|dx$ is :

A. minus 2

B. 0

C. 2

D. 4

Answer: C

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62. $\int_{-a}^{a} \frac{|x|}{x} dx =$

A. 0

B. 1

C. 2

D. none

Answer: A

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63. $\int_{-1}^{1} \frac{|x|}{x} dx =$

A. 2

B. 1

C. 0

D. 44287

Answer: C

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64. $\int_a^b \frac{|x|}{x} dx, (Where 0 < a < b) =$

A. 0

B. a-b

C. b-a

D. none

Answer: C

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65. $\int_{\frac{\pi}{4}}^{\frac{3\pi}{4}} |\sin x| dx =$

A. 0

B. $-\sqrt{2}$

C. $\sqrt{2}$

D. $2-\sqrt{2}$

Answer: B

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66. $\int_0^{\pi}(\cos x+|\cos x|)dx=$

A. 1

B. 2

C. 0

D. minus 2

Answer: B

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67. $\int_{\frac{\pi}{2}}^{\frac{3\pi}{4}} |\cos x| dx =$

A. 0

B. $\sqrt{2}$

C. $2 + \sqrt{2}$

D. $2 - \sqrt{2}$

Answer: D

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68. $\int_{-1}^{1} |x^2 - 3x + 2| dx =$

A. 1

B. -4

C. -2.5

D. 0

Answer: B

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69. $\int_2^3 \left|x^2 - 5x + 6\right| dx =$

A. 1

B. 44352

C. minus 1/6

D. 44348

Answer: D

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70. $\int_0^{\frac{\pi}{2}} \frac{\cos x}{\sin x + \cos x} dx =$

A. 44228

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

C. 44287

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

Answer: D

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71. $\int_2^5 \frac{dx}{x^2+4x+3} =$

A. $\frac{1}{2}\log\left(\frac{5}{4}\right)$

B. $\frac{1}{2}\log\left(\frac{4}{5}\right)$

C. $\log\left(\frac{5}{4}\right)$

D. $\log\left(\frac{4}{5}\right)$

Answer: A

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72. int_0^(pi/2) (cos2x dx)/((sin x+ cos x)^(2)) =`

A. 0

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

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

D. π

Answer: A

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73. $\int_0^{\frac{\pi}{2}} \frac{\sin x - \cos x}{1 + \sin x \cos x} dx =$

A. 0

B. $\log\left(\frac{1}{\sqrt{2}}\right)$

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

D. none

Answer: A

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74. $\int_0^{\frac{\pi}{2}} \frac{4\sin x + 2\cos x}{\sin x + \cos x} dx =$

A. 3π

B. 6π

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

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

Answer: C

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75. $\int_2^4 \frac{dx}{x^2 + x} =$

A. log 8/15

B. $\log\left(\frac{6}{5}\right)$

C. log 2/15

D. 44423

Answer: B

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76. $\int_0^a \sqrt{\frac{a-x}{a+x}}dx =$

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

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

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

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

Answer: B

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77. $\int_0^{\frac{\pi}{4}} \sin 3x . \sin 2x dx =$

A. $\frac{\sqrt{2}}{10}$

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

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

D. $-3\frac{\sqrt{2}}{10}$

Answer: C

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78. `int_0^(2pi) cosmx. Sin nx dx (Where m and n are integers)

A. 0

B. π

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

D. 2π

Answer: A

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79. $\int_0^{\pi} \cos mx . \cos nx dx =$ (m=n)

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

B. 0

C. 1

D. π

Answer: B

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80. $\int_0^{2\pi} \sin mx . \sin nx dx = (m \neq n)$

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

B. 0

C. 1

D. π

Answer: B

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81. Let $f(x) = \begin{cases} e^{\cos x} \sin x, & \text{for} |x| \leq 2 \\ 2 & \text{otherwise} \end{cases}$ then : $\int_{-2}^{3} f(x) dx$ = ...

A. 0

B. 1

C. 2

D. 3

Answer: C

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82. $\int_0^4 \frac{dx}{\sqrt{(x-2)(4-x)}} =$

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

B. π

C. 0

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

Answer: B

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83. The value of $\int_{-\pi}^{\pi} \frac{\cos^2 x}{1+a^x} dx, a > 0$, is :

A. π

B. $a\pi$

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

D. 2π

Answer: C

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84. $\int_{-\pi}^{\pi} \sin 5x . \sin 2x dx =$

A. 0

B. π

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

D. 2π

Answer: A

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85. $\int_{-2}^{2} \left[\cot^{-1}\left(\frac{x-1}{x+1}\right) + \cot^{-1}\left(\frac{x+1}{x-1}\right)\right] dx =$

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

B. π

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

D. 2π

Answer: D

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86. $\int_0^{\infty} \frac{xdx}{(1+x)(1+x^2)} =$

A. ∞

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

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

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

Answer: B

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87. $\int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} \sin x . \cosh x dx =$

A. 0

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

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

D. none of these

Answer: A

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88. $\int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} \cos x . \sinh x dx =$

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

B. e^{π}

C. 0

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

Answer: C

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89. $\int_0^{\frac{\pi}{2}} \log\left(\frac{a+b\sin x}{a+b\cos x}\right)dx =$

A. 0

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

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

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

Answer: A

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90. $\int_3^4 \sqrt{(x-3)(4-x)}dx =$

A. 0

B. 2root(7)

C.

D.

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91. $\int_{-a}^{a} x^n(a+x)dx$, when n is odd =

A. $2\frac{a^{n+2}}{n+2}$

B. $-2\frac{a^{n+2}}{n+2}$

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

D. 0

Answer: A

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92. $\int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} \sin^m x . \cos^n x dx = 0$, if

A. m is even

B. m is odd

C. m=n

D. none

Answer: B

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93. $\int_0^{2\pi} \sin^m x . \cos^n x dx = 4\int_0^{\frac{\pi}{2}} \sin^m x . \cos^n x dx =$

A. m is odd and n is even

B. m,n are both odd

C. m,n are both even

D. none of these

Answer: C

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94. The value of α which satisfies $\int_{\frac{\pi}{2}}^{\alpha} \sin \alpha dx = \sin 2\alpha$ where $\alpha \in [0, 2\pi]$ is

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

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

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

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

Answer: A

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95. $\int_{-\pi}^{\pi} \frac{\sin^4 x dx}{\sin^4 x + \cos^x x} =$

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

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

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

D. π

Answer: D

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96. $\int_0^{\pi} e^{\cos^2}.\cos^3 5x dx =$

A. 0

B. π

C. 2π

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

Answer: A

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97. $\int_{\frac{1}{2}}^{2} \frac{1}{x} \cos ec^{101}\left(x - \frac{1}{x}\right) dx =$

A. 44287

B. 1

C. 0

D. 101/2

Answer: C

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98. $\int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} \sin^8 x \left(6x^7 - 4x^5 + 3x^3 + 2x\right) dx =$

A. π

B. 0

C. 15

D. none of these

Answer: B

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99. If $f(a+b-x) = fx$, then $\int_a^b xf(x)dx$ is equal to :

A. $\frac{a+b}{2}\int_a^b f(b-x)dx$

B. $\frac{a+b}{2}\int_a^b f(x)dx$

C. $\frac{b-a}{2}\int_a^b f(x)dx$

D. $\frac{a+b}{2}\int_a^b f(a-x)dx$

Answer: B

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100. $\int_0^1 \left(1 - \frac{x}{1!} + \frac{x^2}{2!} - \frac{x^3}{3!} + \ldots\ldots\infty\right)e^{2x}dx =$

A. 0

B. e-1

C. 1

D. e

Answer: B

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101. If $f(x) = \cos x - \cos^2 x + \cos^3 x + \ldots. \to \infty \int f(x)dx =$

A. 1

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

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

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

Answer: B

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102. $\int_{\frac{\pi}{4}}^{\frac{\pi}{2}} \left(\cot^4 x + \cot^2 x\right) dx =$

A. 4.4228

B. 0.3333

C. 4.4287

D. 1

Answer: B

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103. If $I_n = \int_0^{\pi/4} \tan^n x dx$, then $\lim_{n \to \infty} n[I_n + I_{n-2}]$ equals :

A. 2/(n-1)

B. (n-1)/2

C. 1/(n-1)

D. 1/(n-2)

Answer: C

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104. If $I_n = \int_0^{\frac{\pi}{4}} \tan^n x dx$, then $n(I_{n-1} + I_{n+1}) =$

A. 1

B. 2

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

D. π

Answer: A

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105. If $I_n = \int_0^{\frac{\pi}{2}} \sin^n x dx$ then $\frac{I_n}{I_{n-2}} =$

A. (n-1)/n

B. n/(n-1)

C. 1/n

D. n

Answer: A

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106. $\int_{\frac{1}{\sqrt{3}}}^{x} \frac{dx}{1+x^2} = \frac{\pi}{6}$, then the upper limit x =

A. $\sqrt{3}$

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

C. 1

D. minus 1

Answer: A

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107. $If \int_0^k \frac{dx}{2+8x^2} = \frac{\pi}{16}$ then k =

A. 1

B. 44228

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

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

Answer: B

Watch Video Solution

108. If $\int_0^k \frac{\cos x}{1+\sin^2 x} dx = \frac{\pi}{4}$ then k=

A. 1

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

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

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

Answer: C

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109. If $\int_0^{\pi} xf(\sin x)dx = A\int_0^{\pi/2} f(\sin x)dx$, then A is :

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

B. π

C. 0

D. 2π

Answer: B

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110. $\int_{\log\left(\frac{1}{2}\right)}^{\log 2} \sin\left(\frac{e^x - 1}{e^x + 1}\right)dx =$

A. cos 1/3

B. 0

C. 2 cos 2

D. none of these

Answer: B

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111. $\int_0^{2\pi} \theta \sin^2 \theta \cos \theta d\theta$ is equal to :

A. 0

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

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

D. $\frac{16\pi}{3}$

Answer: A

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112. The value of integral $\int_{-\pi/4}^{\pi/4} \sin^{-4} x dx$ is :

A. minus 8/3

B. 44230

C. 44263

D. minus 3/2

Answer: A

Watch Video Solution

113. If $I_{10} = \int_0^{\frac{\pi}{2}} x^{10} \sin x dx$ then $I_{10} + 90I_8 =$

A. $9\left(\frac{\pi}{2}\right)^9$

B. $10\left(\frac{\pi}{2}\right)^9$

C. $9\left(\frac{\pi}{2}\right)^8$

D. $\left(\frac{\pi}{2}\right)^9$

Answer: B

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114. Let $A = \int_0^1 \frac{e^t}{t+1} dt$, then $\int_0^1 \frac{t.\, e^{t^2}}{t^2+1} dt =$

A. A

B. 2A

C. 1/2 A

D. A^2

Answer: C

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115. If $\int_0^{\frac{\pi}{2}} \frac{d\theta}{9\sin^2\theta + 4\cos^2\theta} = k\pi$, then k =

A. $\frac{1}{12}$

B. 44531

C. 44409

D. 44256

Answer: B

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116. Let $f(x) = \frac{e^x + 1}{e^x - 1}$ and $\int_0^1 \left(\frac{e^x + 1}{e^x - 1}\right) x dx = \lambda$, then $\int_{-1}^{1} t f(t) dt =$

A. 0

B. λ

C. 2λ

D. $-\lambda$

Answer: C

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117. If $\int_{-1}^{4} f(x)dx = 4$ and $\int_{2}^{4} f(x)dx = 7$ then $\int_{2}^{-1} f(x)dx =$

A. 3

B. minus 5

C. 2

D. 4

Answer: C

Watch Video Solution

118. $\int_{0}^{1} \frac{\sin^2 x + \cos^x}{\cos^x + \sin^x} x^5 dx =$

A. 44256

B. 44287

C. 44317

D. 44348

Answer: D

View Text Solution

119. If $\beta + 2\int_0^1 x^2 e^{-x^2} dx = \int_0^1 e^{-x^2}$, then β =

A. -e^(-1)

B. e-1

C. 1/2 e

D. 1/e

Answer: A

Watch Video Solution

120. $\int_0^{\frac{4}{\pi}} \left(3x^2 \sin\left(\frac{1}{x}\right) - x\cos\left(\frac{1}{x}\right)\right)dx =$

A. $\frac{8\sqrt{2}}{\pi^3}$

B. $\frac{24\sqrt{2}}{\pi^3}$

C. $\frac{32\sqrt{2}}{\pi^3}$

D. $\frac{16\sqrt{2}}{\pi^3}$

Answer: C

Watch Video Solution

121. $\int_0^{\sqrt{\log\left(\frac{\pi}{2}\right)}} \cos\left(e^{x^2}\right).2xe^{x^2}dx =$

A. 1

B. 1+sin(1)

C. 1-sin(1)

D. sin(1)-1

Answer: C

Watch Video Solution

122. $\int_0^{\frac{\pi}{2}} \frac{\cos x - \sin x}{1 + \sin x \cos x} dx =$

A. 2

B. minus 2

C. minus 1

D. 0

Answer: D

Watch Video Solution

123. $\int_{-\frac{1}{2}}^{\frac{1}{2}} \left[\sin^{-1}\left(3x - 4x^3\right) - \cos^{-1}\left(4x^3 - 3x\right)\right] dx =$

A. 0

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

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

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

Answer: B

Watch Video Solution

124. $\int_{-2}^{1} \cot^{-1}\left(\frac{1}{x}\right) dx =$

A. $\frac{9\pi}{2} + 2\tan^{-1} 2 - \frac{1}{5}\log\left(\frac{5}{2}\right)$

B. $\frac{\pi}{4} - 2\tan^{-1} 2 + \frac{1}{2}\log\left(\frac{5}{2}\right)$

C. $\frac{9\pi}{2} - 2\tan^{-1} 2 + \frac{1}{5}\log\left(\frac{5}{2}\right)$

D. $\frac{\pi}{4} + 2\tan^{-1} 2 - \frac{1}{2}\log\left(\frac{5}{2}\right)$

Answer: C

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125. $I = \int_{-2}^{1} \left(\tan^{-1} x + \cot^{-1} \left(\frac{1}{x} \right) dx \right.$

A. $4 \tan^{-1} x - \log 5$

B. $\frac{5\pi}{2} - 4 \tan^{-1} 2 + \log \left(\frac{5}{2} \right)$

C. $\frac{5\pi}{2} + 4 \tan^{-1} 2 - \log \left(\frac{5}{2} \right)$

D. $\log 5 + 4 \tan^{-1} x$

Answer: B

Watch Video Solution

126. $\int_{1}^{\infty} \left(e^{x+1} + e^{3-x} \right)^{-1} dx =$

A. $\frac{\pi}{4} e^2$

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

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

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

Answer: A

Watch Video Solution

127. $\int_1^2 \frac{dx}{x(1+x^4)} =$

A. 1/4 log (17/32)

B. 1/4 log (17/2)

C. log(17/2)

D. 1/4 log (32/17)

Answer: D

Watch Video Solution

128. $I_n = \int_0^{\frac{\pi}{4}} \tan^n x dx, n \in N$, then I_(10)+I_(8) =`

A. 1/9

B. 1/8

C. 1/7

D. 9

Answer: A

Watch Video Solution

129. $\int_0^{\pi} \sin^{50} x . \cos^{49} x dx =$

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

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

C. 0

D. 1

Answer: C

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130. $\int \sqrt{x}.\, e^{\sqrt{x}} dx =$

A. (e-2)/2

B. 2(e-2)

C. 0.2

D. 2(e-1)

Answer: B

Watch Video Solution

131. $\int_0^{10} \frac{x^{10}}{(10-x)^{(10)} + x^{10}} dx =$

A. 10

B. 5

C. 2

D. 44228

Answer: B

Watch Video Solution

132. $\int_0^2 [2x]dx =$, where [.] denotes the greatest function.

A. 2

B. 3

C. 4

D. 5

Answer: B

Watch Video Solution

133. The integral $\int_{-1/2}^{1/2} \left([x] + l_n\left(\frac{1+x}{1-x}\right)\right)dx$ equals :

A. minus 1/2

B. 0

C. 1

D. 2 log 1/2

Answer: A

Watch Video Solution

134. If [.] stands for the greatest integr function, $\int_1^2 [3x]dx =$

A. 3

B. 4

C. 5

D. 6

Answer: B

Watch Video Solution

135. $\int_0^6 |x-3|dx =$

A. 6

B. 9

C. 0

D. 12

Answer: B

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136. If f(x) be a continous function for all real values of x and satisfies $\int_3^x f(t)dt = \frac{x^2}{2} + \int_x^8 t^2 f(t)dt$ then $\int_{-\frac{1}{2}}^1 f(x)dx =$

A. 1/2 log 8/5

B. log 8/5

C. 2 log 8/5

D. 1/4 log 8/5

Answer: A

Watch Video Solution

137. If $f(x) = \int_{2x}^{\sin x} \cos\left(t^3\right) dt$ then $f'(x)$

A. $\cos\left(\sin^3 x\right).\cos x - 2\cos\left(8x^3\right)$

B. $\sin\left(\sin^3 x\right).\sin x - 2\sin\left(8x^3\right)$

C. $\cos\left(\cos^3 x\right).\cos x - 2\cos\left(x^3\right)$

D. $\sin\left(\sin^3 x\right).\cos x - 2\sin\left(8x^3\right)$

Answer: A

Watch Video Solution

138. If $f(x) = \int_1^{x^2} \tan^{-1}\sqrt{t}dt, t > 0$, then $f'(1) =$

A. 1

B. π

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

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

Answer: C

Watch Video Solution

139. If $\int_0^x f(t)dt = x + \int_x^l tf(t)dt$, then the value of $f(1)$ is :

A. sin x

B. -cos x

C. cos x

D. -sin x

Answer: B

Watch Video Solution

140. If $f(x)$ is differentiable and $\int_0^{t^2} xf(x)dx = \frac{2}{5}t^5$, then $f\left(\frac{4}{25}\right)$ equals :

A. 44318

B. minus 5/2

C. 1

D. 44232

Answer: A

Watch Video Solution

141. Equation of the tangent to $y = \int_{x^2}^{x^3} \frac{dt}{\sqrt{1+t^2}}$ at x=1 is

A. $y = x\sqrt{2} - 1$

B. $y\sqrt{2} = x - 1$

C. $y = x\sqrt{2} + 1$

D. $y\sqrt{2} = x + 1$

Answer: B

Watch Video Solution

142. If $\int_a^x f(t)dt - \int_0^y g(t)dt = b$ then dy/dx at (x_0, y_0) is

A. $\frac{f(x_0)}{g(y_0)}$

B. $\frac{g(x_0)}{f(y_0)}$

C. $g(x_0) - f(y_0)$

D. $f(x_0) - g(y_0)$

Answer: A

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143. If $f(x) = \frac{1}{x^2}\int_2^x \left[t^2 + f'(t)\right]dt,$ then $f'(2) =$

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144. If $\int_a^x [f(t) - 3t]dt = a^2 - x^2$ then f(pi/6) =`

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

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

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

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

Answer: A

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145. Let $f(x) = \int_2^x \frac{dt}{\sqrt{1+t^4}}$ and g be the inverse of f. Then $g^{'1}(0) =$

A. 1

B. $\sqrt{17}$

C. $\sqrt{11}$

D. minus 1

Answer: B

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146. If f and g are continuous [0,a) satisfying f(x) = f(a-x) and g(x)+ g(a-x) = 2 then, $\int_0^a f(x)g(x)dx =$

A. $\int_0^a g(x)dx$

B. 1

C. $\int_0^a f(x)dx$

D. 44228

Answer: C

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147. Let $f:[1,\infty) \to [2,\infty)$ be a differentiable function such that f(1) = 1/3. If $\int_1^x f(t)dt = 3xf(x) - x^3$ for all $x \geq 1$, then the value of f(3) =

A. 3

B. 5

C. 6

D. 7

Answer: D

View Text Solution

148. The critical point of :

$f(x) = 1 + x + \int_1^x \left[(\log t)^2 + 2\log t\right] dt$ is :

A. e^{-1}

B. 0

C. $2e^{-1}$

D. $1 + 2e^{-1}$

Answer: A

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149. If $f(\pi) = 2$ and $\int_0^{\pi} [f(x) + f''(x)] \sin x dx = 5$ then f(0)

A. 7

B. 3

C. 5

D. 1

Answer: B

Watch Video Solution

150. $\int_{-1}^{1} \frac{d}{dx}\left(\frac{1}{1+e^{\frac{1}{x}}}\right)dx =$

A. e/(e+1)

B. 1/(e+1)

C. 2/(1+e)

D. (1-e)/(1+e)

Answer: D

Watch Video Solution

151. $\int_{a}^{b} f(x)dx$ is equal to

A. $\int_{b}^{a} f(x-c)dx$

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

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

D. $\int_{a-c}^{b-c} f(x)dx$

Answer: B

View Text Solution

152. If f and g are continuous functions in $[0, 1]$ satisfying $f(x) = f(a - x)$ and $g(x) + g(a - x) = a$, then $\int_0^a f(x).\, g(x)dx$ is equal to :

A. a/2

B. $\frac{a}{2}\int_0^a f(x)dx$

C. $\int_0^a f(x)dx$

D. $a\int_0^a f(x)dx$

Answer: B

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153. If $x = \int_0^y \frac{dt}{\sqrt{1+9t^2}}$ and $\frac{d^2y}{dx^2} = ay$, then a =

A. 3

B. 6

C. 9

D. 11

Answer: C

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154. $\int_{-1}^{1} \frac{x^3 + |x| + 1}{x^2 + 2|x| + 1} dx$ is equal to :

A. log 2

B. 2 log 2

C. 1/2 log 2

D. 4 log 2

Answer: B

Watch Video Solution

155. If $\int_0^1 \frac{e^t}{1+t}dt = a$, then $\int_0^1 \frac{e^t}{(1+t)^2}dt$ is equal to:

A. a-1+e/2

B. a+1-e/2

C. a-1-e/2

D. a+1+ e/2

Answer: B

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156. $\int_{-2}^{2} |x \cos \pi x| dx$ is equal to :

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

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

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

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

Answer: A

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157. $\int_{-\pi/4}^{\pi/4} \frac{dx}{1+\cos 2x}$ is equal to

A. 1

B. 2

C. 3

D. 4

Answer: A

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158. $\int_{0}^{\pi/4} \sqrt{1-\sin 2x} dx$ is equal to :

A. $2\sqrt{2}$

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

C. 2

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

Answer: D

Watch Video Solution

159. Choose the correct answer

$\int_1^{\sqrt{3}} \frac{dx}{1+x^2}$ equals

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

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

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

D. $\frac{\pi}{12}$

Answer: D

Watch Video Solution

160. Choose the correct answer

$\int_0^{\frac{2}{3}} \frac{dx}{4+9x^2}$ equals

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

B. $\frac{\pi}{12}$

C. $\frac{\pi}{24}$

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

Answer: C

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161. If $f(x) = \int_0^x t \sin t dt,$ then f'(x) is

A. cos x + x sin x

B. x sin x

C. x cos x

D. sinx+cosx

Answer: B

Watch Video Solution

162. Choose the correct answer

The value of the integral $\int_{\frac{1}{3}}^{1} \frac{\left(x-x^3\right)^{\frac{1}{3}}}{x^4} dx$ is

A. 6

B. 0

C. 3

D. 4

Answer: A

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163. Choose the correct answer

The value of $\int_{\frac{-\pi}{2}}^{\frac{\pi}{2}} \left(x^3 + x\cos x + \tan^5 x + 1\right) dx$ is

A. 0

B. 2

C. π

D. 1

Answer: C

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164. The value of $\int_0^{\frac{\pi}{2}} \log\left(\frac{4+3\sin x}{4+3\cos x}\right) dx$ is

A. 2

B. 44289

C. 0

D. minus 2

Answer: C

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165. If $f(a+b-x) = fx$, then $\int_a^b xf(x)dx$ is equal to :

A. $\frac{a+b}{2}\int_a^b f(b-x)dx$

B. $\frac{a+b}{2}\int_a^b f(b+x)dx$

C. $\frac{b-a}{2}\int_a^b f(x)dx$

D. $\frac{a+b}{2}\int_a^b f(x)dx$

Answer: D

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166. The value of $\int_0^1 \tan^{-1}\left(\frac{2x-1}{1+x-x^2}\right)dx$ is

A. 1

B. 0

C. minus 1

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

Answer: B

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167. $\lim_{n \to \infty} \sum_{r=1}^{n} \frac{r}{n^2} \sec^2\left(\frac{r^2}{n^2}\right) =$

A. tan 1

B. 1/3 tan 1

C. 1/2 tan 1

D. none of these

Answer: C

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168. $\lim_{n \to \infty} \frac{1}{2}[(n+1)(n+2).....2n]^{\frac{1}{n}} =$

A. 4/e

B. 2/e

C. 1/e

D. e

Answer: A

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169. $\lim_{n \to \infty} \left[\left(1+\frac{1}{n}\right)\left(1+\frac{2}{n}\right).....2\right]^{\frac{1}{n}} =$

A. 4/e

B. log 4

C. - 4

D. 0

Answer: A

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170. $\lim_{n \to \infty} \frac{1}{n^{100}}\left(1^{99} + 2^{99} + 3^{99} + \ldots\ldots\ldots + n^{99}\right) =$

A. 100

B. 36161

C. 1/100

D. 99

Answer: C

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171. $\lim_{n \to \infty} \sum_{r=1}^{n} \frac{1}{n} e^{\frac{r}{n}}$ is :

A. e+1

B. e

C. e-1

D. minus e

Answer: C

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172. $\lim_{n \to \infty} \sum_{r=1}^{n} \frac{1}{n} \sec^2\left(\frac{r\pi}{4n}\right) =$

A. 1

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

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

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

Answer: D

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173. $\lim_{n \to \infty} \frac{1}{n} \sum_{r=1}^{n} \sqrt{\frac{r}{n}} =$

A. 44228

B. 44257

C. 2

D. 0

Answer: B

View Text Solution

174.

$$\lim_{n \to \infty} \frac{1}{n} \left[\sin\left(\frac{\pi}{2n}\right) + \sin\left(\frac{\pi}{n}\right) + \sin\left(\frac{3\pi}{2}n\right) + \ldots\ldots\ldots + \sin\left(\frac{\pi}{2}\right) \right] =$$

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

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

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

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

Answer: B

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175. The area between the curves $y = 2x - x^2$ and the x-axis is

A. 1.6

B. 1.3333333333333

C. 1.6666666666667

D. 2.3333333333333

Answer: B

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176. The area bounded by the curve $y = x^2 - 7x + 10$ and the x - axis is

A. 44232

B. 44266

C. 44236

D. 44230

Answer: C

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177. The area bounded by$y^2 = x^3$, the y-axis and the lines y=1 and y=2 is

A. 44232

B. $3\left(2^{\frac{5}{3}}\right)$

C. 44319

D. $\frac{3}{5}\left(2^{\frac{5}{3}} - 1\right)$

Answer: D

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178. The area bounded by y=sin x and x-axis from x=0 to $x = \pi$ is

A. 2

B. π

C. π^2

D. none of these

Answer: A

Watch Video Solution

179. The area bounded by y=sin x and x-axis from x=0 to $x = \pi$ is

A. 44228

B. 44230

C. 2

D. 1

Answer: A

Watch Video Solution

180. Area under the curve y= sin 2x + cos 2x between the ordinates x=0 and $x = \frac{\pi}{4}$ is

A. 2

B. 1

C. 4

D. $\sqrt{2}$

Answer: B

Watch Video Solution

181. The area enclosed by the curve $y = \sin^3 x$ between x=0 and $x = \frac{\pi}{2}$

A. 2/3

B. 44228

C. 44257

D. 44348

Answer: C

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182. The area of the figure bounded by the curves y=cosx and y=sinx and the coordinates x=0 and x=$\pi / 4$ is

A. $\sqrt{2} - 1$

B. $\sqrt{2} + 1$

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

D. $\frac{1}{\sqrt{2}}$

Answer: A

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183. The area bounded by the parabola $y^2 = 4x$ and $x^2 = 4y$ is

A. 44271

B. 32/3

C. 64/3

D. 44263

Answer: B

View Text Solution

184. Area of the region bounded by $y^2 = 8x$ and the latus rectum is

A. 16/3

B. 34/3

C. 33/3

D. 32/3

Answer: D

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185. Area bounded by the barabola $y^2 = 8x$ and the line y=3x is

A. 31/81

B. 32/81

C. -32/27

D. 32/27

Answer: B

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186. Area bounded by $y = x^2$ and y=2x is

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

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

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

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

Answer: B

Watch Video Solution

187. The are bounded by the parabola $y^2 = 4ax$ and the line x = a and x = 4a is...

A. $4a^2$

B. $28a^2$

C. $\frac{28}{3}a^2$

D. none of these

Answer: C

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188. Area bounded by y=3x and $y = x^2$ is

A. 44254

B. 9/2

C. 44265

D. 44236

Answer: C

Watch Video Solution

189. Find the area of the smaller region enclosed by the circle $x^2 + y^2 = 4$ and the line x+y=2 by the integration method.

A. $\pi - 2$

B. $\pi + 2$

C. $2 - \pi$

D. $\frac{1}{2}(\pi + 2)$

Answer: A

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190. Area of the region bounded by $\frac{x^2}{16} + \frac{y^2}{9} = 1$ and the line x/4+y/3 =1 is

A. $3(\pi - 2)$

B. $3(\pi + 2)$

C. $3(\pi - 1)$

D. $3(\pi + 1)$

Answer: A

Watch Video Solution

191. Area of the ellipse $\frac{x^2}{9} + \frac{y^2}{4} = 1$ is

A. 36π

B. 6π

C. 6

D. none of these

Answer: B

Watch Video Solution

192. Area bounded by $xy = a^2$, the axis and the lines $x = a$ and $x = 4a(a > 0)$ is

A. $2a^2 \log 2$

B. $4a^2 \log 4$

C. $2a \log 4$

D. none of these

Answer: A

Watch Video Solution

193. The area bounded by xy =1, x =0, y=1 and y=2 is

A. 2 log 2

B. $\log \sqrt{2}$

C. log 2

D. $2 \log \sqrt{2}$

Answer: C

Watch Video Solution

194. Find the area of the circle $x^2 + y^2 = 4$ bounded by the lines x = 0 and x = 2 which is lying in the first quadrant.

A. π

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

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

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

Answer: A

Watch Video Solution

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

A. 2

B. 44295

C. 44264

D. 44236

Answer: B

View Text Solution

196. Using the method of integration, find the smaller area enclosed by the circle $x^2 + y^2 = 4$ and the line x+y=2.

A. $2(\pi - 2)$

B. $\pi - 2$

C. 2pi-1

D. $2(\pi + 2)$

Answer: B

Watch Video Solution

197. Area lying between the curves $y^2 = 4x$ and y = 2x is

A. 44257

B. 44256

C. 44287

D. 44289

Answer: B

Watch Video Solution

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

A. 0

B. 44256

C. 44257

D. 44259

Answer: C

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

A. $\min us 9$

B. $\min us \frac{15}{4}$

C. 44301

D. 44303

Answer: D

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200. The area of the circle $x^2 + y^2 = 16$ exterior to the parabola $y^2 = 6x$ is

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: C

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

A. 32/3

B. 256/3

C. 64/3

D. 128/3

Answer: B

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202. The area of the region bound by Y-axis, y = cos x and y = sin x, $0 \leq x \leq \frac{\pi}{2}$ is

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

B. $\sqrt{2}-1$

C. $\sqrt{2}+1$

D. $\sqrt{2}$

Answer: B

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

A. 3/8 sq.units

B. 5/8 sq.unit

C. 7/8 sq. unit

D. 9/8 sq.unit

Answer: D

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

A. $8\pi sq.\ units$

B. $20\pi sq.\ units$

C. $16\pi sq.\ units$

D. `256pi sq.units)

Answer: A

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

A. $16\pi sq.\ units$

B. $4\pi sq.\ units$

C. $32\pi sq.\ units$

D. $24\pi sq.\ units$

Answer: B

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206. Area of the region bounded by the curve y = cos x, x = 0 and $x = \pi$ is

A. 2 sq.units

B. 4 sq.units

C. 3 sq.units

D. 1 sq.units

Answer: A

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

A. 4/3 sq.units

B. 1 sq.uni

C. 2/3 sq.units

D. 1/3 sq. units

Answer: A

Watch Video Solution

208. 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 :

A. 2 sq.units

B. 4 sq.units

C. 3 sq.units

D. 1 sq.units

Answer: D

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209. Area of the region bounded by the curve y=x+1 and the lines x=2 and x =3 is

A. 7/2 sq. units

B. 9/2 sq.units

C. 11/2 sq. units

D. 13/2 sq.units

Answer: A

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

A. 4 sq. units

B. 3/2 sq. units

C. 6 sq. units

D. 8 sq.units

Answer: C

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211. $\int_0^{\pi/2} \frac{\sin^{3/2} x}{\sin^{3/2} x + \cos^{3/2} x} dx =$

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

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

C. π

D. 1

Answer: B

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212. $\int_{\pi/4}^{\pi/2} \cot x dx =$

A. log 2

B. $\log \sqrt{2}$

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

D. 2 log 2

Answer: B

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213. $\int_0^{\frac{1}{2}} \frac{dx}{\sqrt{1-x^2}} =$

A. π

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

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

D. none of these

Answer: B

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214. $\int_0^{\pi/2} \frac{dx}{a^2\cos^2 x + b^2 \sin^2 x} =$

A. $2\pi ab$

B. $\pi a^2 b^2$

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

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

Answer: D

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215. $\int_0^{\pi/2} \frac{dx}{1+\tan x} =$

A. π

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

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

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

Answer: B

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216. $\int_0^a \sqrt{a^2 - x^2} dx =$

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

B. πa^2

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

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

Answer: D

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217. $\int_0^{\pi/2} \log(\tan x) dx$ is :

A. 0

B. 1

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

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

Answer: A

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218. Given $\int_0^\infty \frac{x^2 dx}{(x^2+a^2)(x^2+b^2)(x^2+c^2)} = \frac{\pi}{2(a+b)(b+c)(c+a)}$ the value of $\int_0^\infty \frac{dx}{(x^2+4)(x^2+9)} =$

A. $\frac{\pi}{60}$

B. $\frac{\pi}{20}$

C. $\frac{\pi}{40}$

D. $\frac{\pi}{80}$

Answer: A

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219. $\int_0^{\pi} \frac{dx}{a + b\cos x} =$

A. $\frac{\pi}{\sqrt{a^2 - b^2}}$

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

C. $\frac{\pi}{\sqrt{a^2 + b^2}}$

D. $(a + b)\pi$

Answer: A

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220. $\int_0^1 \tan^{-1} x dx =$

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

B. $\frac{\pi}{4} + \log 2$

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

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

Answer: C

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221. The value of the integral $\int_0^1 \sqrt{\frac{1-x}{1+x}} dx$ is :

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

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

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

D. $\pi + 1$

Answer: B

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222. Which one of the following is not correct?

A. $\int_0^a f(x)dx = \int_0^a f(a-x)dx$

B. $\int_{-a}^a f(x)dx = 2\int_0^a f(x)dx$

C. $\int_0^a f(x)dx = \int_0^a f(t)dx$

D. $\int_a^b f(x)dx = -\int_b^a f(x)dx$

Answer: B

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223. $\int_0^{\frac{\pi}{4}} \tan^2 x dx$

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

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

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

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

Answer: A

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224. $\int_0^2 |1-x|dx =$

A. -1

B. 1

C. 2

D. 4

Answer: B

Watch Video Solution

225. $\int_0^{\frac{\pi}{2}} \frac{\sin x - \cos x}{1+\sin x \cos x} dx =$

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

B. 0

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

D. 1

Answer: B

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226. $\int_{-1}^{2} |x| dx =$

A. 1

B. 44230

C. 5/2

D. 44232

Answer: D

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227. $\int_{0}^{\infty} \operatorname{sech} x dx =$

A. 1

B. π

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

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

Answer: C

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228. $\int_0^{\frac{\pi}{2}} \frac{dx}{1 + \cot x} =$

A. π

B. 0

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

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

Answer: D

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229. If $f(m, n) = \int_0^{\frac{\pi}{2}} \cos^m x . \cos nx$ and f(m,n) = m/(m+n) f(m-1, n-1) then f(n,n)=

A. 1/2 f(n,n)

B. $\frac{\pi}{2^{n+1}}$

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

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

Answer: B

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230.

$$\int \frac{dx}{a + b\cos x} = \frac{1}{\sqrt{a^2 - b^2}} \cos^{-1}\left[\frac{b + a\cos x}{a + b\cos x}\right] then \int_0^{\pi} \frac{dx}{a + b\cos x} =$$

A. $\frac{1}{\sqrt{a^2 - b^2}}$

B. $\frac{2}{\sqrt{a^2 - b^2}}$

C. $\frac{\pi}{\sqrt{a^2 - b^2}}$

D. $\frac{-1}{\sqrt{a^2 - b^2}}$

Answer: C

Watch Video Solution

231. $\int_0^{\frac{\pi}{2}} \frac{1}{1 + (\cot x)^{10}} dx =$

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

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

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

D. 0

Answer: C

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232. $\int_0^{\pi/2} \log \sin x dx =$

A. $\frac{\pi}{2}\log\left(\frac{1}{2}\right)$

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

C. $\pi \log 2$

D. $-\pi \log 2$

Answer: A

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233. $\int_0^{\pi/2} \cos x e^{\sin x} dx$ is :

A. e-1

B. e+1

C. e

D. e+2

Answer: A

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234. $\int_{-1}^{1} \frac{d}{dx}\left(\left(\tan^{-1}\right)\frac{1}{x}\right)dx =$

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

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

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

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

Answer: B

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235. If $I_n = \int_0^1 x^n . e^{-x} dx,\ \forall n \in N$ then $I_7 - 7I_6 =$

A. -1/e

B. 1/e

C. - e

D. e+2

Answer: A

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236. If $\int_0^a f(x)dx = \int_0^a f(a-x)dx$, then the value of $\int_0^\pi x.\, f(\sin x)dx =$

A. $\int_0^\pi x f(\cos x)dx$

B. $\frac{\pi}{2}\int_0^\pi f(\sin x)dx$

C. $\frac{\pi}{2}\int_0^{\frac{\pi}{2}} f(\sin x)dx$

D. $\frac{2}{\pi}\int_0^\pi f(\sin x)dx$

Answer: B

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237. $\int_0^{\frac{\pi}{2}} \frac{a\sin x + b\cos x}{\sin x + \cos x} dx =$

A. $(a+b)\frac{\pi}{4}$

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

C. $(a+b)\frac{\pi}{2}$

D. $(a+b)\pi$

Answer: A

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238. The value of $\int_0^{\frac{\pi}{2}} \frac{2^{\sin x}}{2^{\sin x} + 2^{\cos x}} dx$ is

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

B. 2

C. π

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

Answer: D

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239. Evaluate the integrals by using substitution

$$\int_0^1 \sin^{-1}\left(\frac{2x}{1+x^2}\right)dx$$

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

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

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

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

Answer: D

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240. Evaulate $\int_0^{\pi/4} \log(1+\tan x)dx.$

A. $\frac{\pi}{8}\log(\tan x)$

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

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

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

Answer: D

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241. If $I_1 = \int_e^{e^2} \frac{dx}{\log x}$ and $I_2 = \int_1^2 \frac{e^x dx}{x}$ then

A. $2I_1 = I_2$

B. $I_1 = I_2$

C. $I_1 + 2I_2$

D. $I_1 + I_2 = 0$

Answer: B

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242. If f(x) is integrable on [0,a], then $\int_0^a \frac{f(x)}{f(x)+f(a-x)}dx =$

A. a

B. 2a

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

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

Answer: A

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243. If $I_n = \int_0^{\pi/4} \tan^n \theta d\theta$, then for any +ve integer n, the value of $n(I_{n-1} + I_{n+1})$ is :

A. minus 1

B. 2

C. 1

D. minus 2

Answer: C

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244. The value of $\int_{-\frac{1}{2}}^{\frac{1}{2}} (\cos x).\log\left(\frac{1-x}{1+x}\right)dx$ is

A. 1

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

C. 0

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

Answer: C

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245. The value of $\int_0^{\pi} \frac{dx}{5+3\cos x}$ is

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

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

C. 0

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

Answer: B

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246. $\int_0^{\pi} \frac{x dx}{a^2\cos^2 x + b^2 \sin^2 x} =$

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

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

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

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

Answer: C

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247. $\int_0^{2\pi} (\sin x + |\sin x|)dx =$

A. 4

B. 0

C. 1

D. 8

Answer: A

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248. $\int_0^{\infty} \frac{xdx}{(1+x)(1+x^2)} =$

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

B. 0

C. 1

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

Answer: D

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249. $\int_0^{\frac{\pi}{8}} \cos^3 4\theta d\theta =$

A. 1/9

B. 1/6

C. 6

D. 4

Answer: D

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250. $\int_{\frac{\pi}{4}}^{\frac{\pi}{2}} \cos ec^2 x dx =$

A. 0

B. 4

C. -1

D. 1

Answer: D

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251. If $I_1 = \int_0^{\pi/2}$ x sin x dx and $I_2 = \int_0^{\pi/2}$ x cos x dx, then which one of the following is true ?

A. $I_1 = I_2$

B. $I_1 + I_2 = 0$

C. $I_1 = \frac{\pi}{2} I_2$

D. $I_1 + I_2 = \frac{\pi}{2}$

Answer: D

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252. If f (x) is defined $[-2, 2]$ by $f(x) = 4x^2 - 3x + 1$ and $g(x) = \frac{f(-x) - f(x)}{(x^2 + 3)}$, then $\int_{-2}^{2} g(x)dx =$

A. 24

B. 0

C. minus 48

D. 64

Answer: B

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253. If $k\int_0^1 x.\, f(3x)dx = \int_0^3 t.\, f(t)dt$, then the value of k is

A. 3

B. 9

C. 44256

D. 44440

Answer: B

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254. The value of the integral $\int_0^{\pi/2} \left(\sin^{100} x - \cos^{100} x\right) dx$ is :

A. $\frac{100!}{(100)^{100}}$

B. 1/100

C. 0

D. $\frac{\pi}{100}$

Answer: C

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255. $\int_1^3 (x-1)(x-2)(x-3)dx =$

A. 3

B. 2

C. 1

D. 0

Answer: D

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256. If 2f(x)- 3f(1/x) = x then $\int_1^e f(x)dx =$

A. $-\left(\frac{2+e^2}{5}\right)$

B. (2+e)/5

C. $\frac{2+e^2}{5}$

D. none of these

Answer: A

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257. If [x] denote the greatest integer function , then , $\int_0^{\pi/6} \frac{1-\cos 2x}{1+\cos 2x} d(x-[x]) =$

A. $\frac{1}{\sqrt{3}} + \frac{\pi}{6}$

B. $\frac{1}{\sqrt{3}} - \frac{\pi}{6}$

C. $\sqrt{3} - \frac{\pi}{6}$

D. $\sqrt{3} + \frac{\pi}{6}$

Answer: B

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258. The value of the integral, $\int_3^6 \frac{\sqrt{x}}{\sqrt{9-x}+\sqrt{x}}dx$ is :

A. 2

B. 1

C. 44228

D. 44230

Answer: D

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259. $\int_0^{10\pi} |\sin x| dx$ is

A. 20

B. 8

C. 10

D. 18

Answer: A

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260. $\int_{-\pi}^{\pi} \frac{2x(1+\sin x)}{1+\cos^2 x} dx$ is :

A. $\frac{\pi^2}{4}$

B. π^2

C. 0

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

Answer: B

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261. If $I_n = \int_0^{\pi/4} \tan^n x dx$, then $\lim_{n \to \infty} n[I_n + I_{n-2}]$ equals :

A. 44228

B. 1

C. ∞

D. zero

Answer: B

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262. If $f(a+b-x) = fx$, then $\int_a^b xf(x)dx$ is equal to :

A. $\frac{a+b}{2}\int_a^b f(x)dx$

B. $\frac{b-a}{2}\int_a^b f(x)dx$

C. $\frac{a+b}{2}\int_a^b f(a+b-x)dx$

D. $\frac{a+b}{2}\int_a^b f(b-x)dx$

Answer: A

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263. The value of the integral $I = \int_0^1 x(1-x)^n dx$ is :

A. 1/(n+2)

B. 1/(n+1)-1/(n+2)

C. 1/(n+1)+1/(n+2)

D. 1/(n+1)

Answer: B

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264. Let $\frac{d}{dx}F(x) = \left(\frac{e^{\sin x}}{x}\right), x > 0$. If $\int_1^4 \frac{3}{x}e^{\sin x^3}dx = F(k) - F(1)$, then one of the possible values of k is :

A. 16

B. 63

C. 64

D. 15

Answer: C

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265. If $f(y) = e^y, g(y) = y, y > 0$ and $F(t) = \int_0^t f(t-y)g(y)dy$, then

A. $F(t) = e^t - (1+t)$

B. $F(t) = t.\, e^t$

C. $F(t) = t.\, e^{-1}$

D. $F(t) = 1 - e^t(1+t)$

Answer: A

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266. Let $f(x)$ be a function satisfying $f'(x) = f(x)$ with $f(0) = 1$ and $g(x)$ be a function that satisfies $f(x) + g(x) = x^2$. Then the value of the integral $\int_0^1 f(x)g(x)dx$ is :

A. $e + \frac{e^2}{2} - \frac{3}{2}$

B. $e.\ \frac{e^2}{2} - \frac{3}{2}$

C. $e + \frac{e^2}{2} + \frac{5}{2}$

D. $e - \frac{e^2}{2} - \frac{5}{2}$

Answer: B

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267. If $f(x) = \frac{e^x}{1+e^x}, I_1 = \int_{f(-a)}^{f(a)} xg\{x(1-x)\}dx$ and $I_2 = \int_{f(-a)}^{f(a)} g\{x(1-x$, then $\frac{I_2}{I_1}$ is :

A. 2

B. minus 3

C. minus 1

D. 1

Answer: A

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268. The value of $I = \int_0^{\pi/2} \frac{(\sin x + \cos x)^2}{\sqrt{1 + \sin 2x}} dx$ is :

A. 0

B. 1

C. 2

D. 3

Answer: C

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269. The value of $\int_{-2}^{3} |1 - x^2| dx$ is:

A. 44283

B. 44269

C. 44262

D. 44256

Answer: A

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270. If $\int_0^{\pi} x f(\sin x) dx = A \int_0^{\pi/2} f(\sin x) dx$, then A is :

A. 0

B. π

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

D. 2π

Answer: A

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271. Let $F: R \to R$ be a differentiable function having : $f(2) = 6, f'(2) = \frac{1}{48}$

Then $\lim_{x \to 2} \int_6^{f(x)} \frac{4t^3}{x-2} dt$ equals :

A. 36

B. 24

C. 18

D. 12

Answer: C

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272. $\int_0^{\pi} x f(\sin x) dx$ is equal to :

A. $\pi \int_0^{\pi} f(\cos x) dx$

B. $\pi \int_0^{\pi} f(\sin x) dx$

C. $\frac{\pi}{2} \int_0^{\pi} f(\sin x) dx$

D. $\pi \int_0^{\frac{\pi}{2}} f(\cos x) dx$

Answer: D

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273. $\int_{-3\pi/2}^{-\pi/2} \left[(x+\pi)^3 + \cos^2(x+3x)\right] dx$ is equal to :

A. $\frac{\pi^4}{32}$

B. $\frac{\pi^4}{32} + \frac{\pi}{2}$

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

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

Answer: C

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274. If $f(x) = \begin{cases} e^{\cos x} \sin x; |x| \leq 2 \\ 2; otherwise' \end{cases}$ then $\int_{-2}^{3} f(x)dx$ is equal to

A. 0

B. 1

C. 2

D. 3

Answer: C

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275. The value of integral $\int_{e^{-1}}^{e^2} \left| \frac{\log_e x}{x} \right| dx$ is :

A. 44230

B. 44232

C. 3

D. 5

Answer: B

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276. Let $g(x) = \int_0^x f(t)dt$, where $\frac{1}{2} \leq f(t) < 1, t \in [0, 1]$ and $0 < f(t) \leq \frac{1}{2}$ for $t \in [1, 2]$. Then :

A. $-\frac{3}{2} \leq g(2) < \frac{1}{2}$

B. $0 \leq g(2) < 2$

C. $-\frac{3}{2} < g(2) \leq \frac{5}{2}$

D. $2 < g(x) < 4$

Answer: B

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277. The value of $\int_{-\pi}^{\pi} \frac{\cos^2 x}{1+a^x} dx,\ a > 0$, is :

A. π

B. $a\pi$

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

D. 2π

Answer: C

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278. Let $f:(0,\infty) \to R$ and $F(x) = \int_0^x f(t)dt.$

If $F\left(x^2\right) = x^2(1+x)$, then $f(4)$ equals :

A. 44291

B. 7

C. 4

D. 2

Answer: C

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279. Let $f(x) = \int_1^x \sqrt{2 - t^2} dt$. Then the real roots of the equation $x^2 - f(x) = 0$ are:

A. ± 1

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

C. $\pm \frac{1}{2}$

D. 0 and 1

Answer: A

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280. The integral $\int_{-1/2}^{1/2}\left([x]+l_n\left(\frac{1+x}{1-x}\right)\right)dx$ equals :

A. minus 1/2

B. 0

C. 1

D. 2log(1/2)

Answer: A

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281. If $I(m,n)=\int_0^1 t^m(1+t)^n dt, m,n\in R$, then $I(m,n)$ is :

A. $\frac{n}{1+m}I[(m+1),((n-1)]$

B. $\frac{m}{n+1}I[(m+1),((n-1)]$

C. $\frac{2^n}{1+m}-\frac{m}{1+n}I[m+1,n-1]$

D. 2^(n)/(1+m)-m/(1+n) I [(m+1),((n-1)]`

Answer: C

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282. The value of the integral $\int_0^1 \sqrt{\frac{1-x}{1+x}}dx$ is :

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

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

C. minus 1

D. 1

Answer: B

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283. If $f(x)$ is differentiable and $\int_0^{t^2} xf(x)dx = \frac{2}{5}t^5$, then $f\left(\frac{4}{25}\right)$ equals :

A. 44318

B. minus 5/2

C. 1

D. 44232

Answer: A

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284. If $\int_{\sin x}^{1} t^2 f(t)dt = 1 - \sin x$, then the value of $f\left(\frac{1}{\sqrt{3}}\right)$ is :

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

B. 44256

C. $\sqrt{3}$

D. 3

Answer: D

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285. $\int_{-2}^{0}\{x^3+3x^2+3x+3+(x+1)\cos(x+1)\}dx$ is equal to :

A. 0

B. 3

C. 4

D. 1

Answer: C

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286. $\int_{0}^{\pi/2}\frac{dx}{1+\tan x}=$

A. log 2

B. 1

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

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

Answer: D

Watch Video Solution

287. $I_{m,n} = \int_0^1 x^m (l_n x)^n dx$ equals:

A. n/(m+1) I (m,n-1)

B. $-\frac{m}{m+1} I(m, n-1)$

C. $-\frac{n}{m+1} I(m, n-1)$

D. m/(n+1) I (m,n-1)

Answer: C

Watch Video Solution

288. $\int_0^1 \sqrt{x(1-x)} dx =$

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

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

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

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

Answer: D

Watch Video Solution

289. Evaluate $\int_0^{\pi} \frac{x \sin x}{1 + \cos^2 x} dx$

A. $\frac{\pi^2}{8}$

B. $\frac{\pi^2}{4}$

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

D. $\frac{\pi^4}{8}$

Answer: B

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290. $\int_0^{\infty} \left(a^{-x} - b^{-x}\right) dx =$

A. 1/(loga)-1/(logb)

B. log a - log b

C. log a + log b

D. 1/(loga)+1/(logb)

Answer: A

Watch Video Solution

291. $\int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} \cos\theta(1+\sin\theta)^2 d\theta =$

A. -8/3

B. 8/3

C. -8/5

D. - 5/8

Answer: C

Watch Video Solution

292. $\int_0^1 \frac{1-x}{1+x} dx =$

A. 2 log 2-1

B. 1+ log 4

C. log 2-1

D. 2 log 2

Answer: A

Watch Video Solution

293. $\int_{-1}^{1} \tan^{-1} x dx =$

A. 0

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

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

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

Answer: A

Watch Video Solution

294. $\int_0^{\frac{\pi}{2}} \sin^6 x . \cos^5 x dx =$

A. 8/693

B. 5/693

C. 4/693

D. 10/693

Answer: A

Watch Video Solution

295. $\int_0^{\pi} \cos^3 x dx =$

A. minus 1

B. 0

C. 1

D. $\frac{1}{2}\sqrt{2}$

Answer: B

Watch Video Solution

296. int_0^(pi/4) (tan^(4)x + tan^(2)x) dx =`

A. 1

B. 44228

C. 44256

D. 44287

Answer: C

View Text Solution

297. If f(x) is integrable on [0,a], then $\int_0^a \frac{f(x)}{f(x)+f(a-x)}dx =$

A. 10

B. 1

C. a

D. a/2

Answer: D

Watch Video Solution

298. $\int_0^1 \frac{x}{(1-x)^{\frac{5}{4}}}dx =$

A. 44271

B. 42430

C. minus 3/16

D. minus 16/3

Answer: D

View Text Solution

299. $\int_{-1}^{1}(ax^3+bx)dx=0$ for

A. any value of a and b

B. $a>0$ and $b>0 only$

C. $a>0$ and b lt 0 only`

D. $a<0$ and $b<0 only$

Answer: A

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300. $\int_0^{\frac{\pi}{2}} \sin^8 x . \cos^2 x dx =$

A. $\frac{\pi}{512}$

B. $\frac{3\pi}{512}$

C. $\frac{5\pi}{512}$

D. $\frac{7\pi}{512}$

Answer: D

Watch Video Solution

301. $\int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} \sin^4 x . \cos^6 x dx =$

A. $\frac{3\pi}{128}$

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

C. $\frac{3\pi}{572}$

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

Answer: B

Watch Video Solution

302. $\int_2^3 \frac{dx}{x^2 - x} =$

A. log 2/3

B. log 4/3

C. log 8/3

D. log 1/4

Answer: B

Watch Video Solution

303. $\int_0^3 \frac{3x + 1}{x^2 + 9} dx =$

A. $\log\left(2\sqrt{2}\right)+\frac{\pi}{12}$

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

C. $\log\left(2\sqrt{2}\right)+\frac{\pi}{6}$

D. $\log\left(2\sqrt{2}\right)+\frac{\pi}{3}$

Answer: A

Watch Video Solution

304. $\int_0^1 \sin\left(2\tan^{-1}\sqrt{\frac{1+x}{1-x}}\right)dx =$

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

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

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

D. π

Answer: B

Watch Video Solution

305. $\int_0^1 \frac{\theta \sin\theta}{1+\cos^2\theta} d\theta =$

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

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

C. π^2

D. $\frac{\pi^2}{4}$

Answer: D

View Text Solution

306. $\int_0^{\frac{\pi}{2}} \frac{200\sin x + 100\cos x}{\sin x + \cos x} dx =$

A. 50π

B. 25π

C. 75π

D. 150π

Answer: C

Watch Video Solution

307. $\int_{-1}^{1} \frac{\cosh x}{1+e^{2x}} dx =$

A. 0

B. 1

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

D. $\frac{e^2+1}{2}e$

Answer: C

Watch Video Solution

308. $\int_{0}^{\pi/2} \frac{dx}{1+\tan x} =$

A. π

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

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

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

Answer: C

Watch Video Solution

309. The value of $\int_{-\frac{\pi}{4}}^{\frac{\pi}{4}} x^3 \sin^4 x dx =$

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

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

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

D. 0

Answer: D

Watch Video Solution

Watch Video Solution

310. $\int_0^{\frac{\pi}{2}} \sin 2x . \log(\tan x) dx =$

A. π

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

C. 0

D. 2π

Answer: C

Watch Video Solution

311. If f(t) is an odd function then $\int_0^x f(t(dt$ is

A. an odd function

B. an even function

C. neither even nor odd

D. 0

Answer: B

Watch Video Solution

312. $\int_0^{\frac{\pi}{2}} \frac{\cos\theta}{\sqrt{4-\sin^2\theta}} d\theta =$

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

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

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

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

Answer: B

Watch Video Solution

313. The value of the integral $\int_0^{2a} \frac{f(x)}{f(x)+f(2a-x)}$ is :

A. f(a)

B. f(2a)

C. f(0)

D. a

Answer: D

Watch Video Solution

314. $\int_{\pi/6}^{\pi/3} \frac{dx}{1+\sqrt{\tan x}} =$

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

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

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

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

Answer: A

Watch Video Solution

315. $\int_{-\pi}^{\pi} \frac{\sin^4 x}{\sin^4 x + \cos^4 x} dx =$

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

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

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

D. π

Answer: D

View Text Solution

316. $\int_{-2}^{2} |x| dx =$

A. 0

B. 1

C. 2

D. 4

Answer: D

Watch Video Solution

317. Suppose f is such that f(-x) = -f(x) for all real x and $\int_0^1 f(x)dx = 5$, then $\int_{-1}^0 f(t)dt =$

A. 0

B. 5

C. -5

D. -5/8

Answer: D

Watch Video Solution

318. $\int_{-1}^{0} (9x^2 + 2x + 2)dx =$

A. 0

B. 4

C. 2

D. -4

Answer: B

Watch Video Solution

319. $\int_{-1}^{1} \log\left(x + \sqrt{x^2 + 1}\right)dx =$

A. 0

B. log 2

C. log 1/2

D. none of these

Answer: A

Watch Video Solution

320. If $F(x) = \int_{x^2}^{x^3} \log t dt, (t > 0)$ then $F'(x)$ is equal to

A. $\left(9x^2 - 4x\right)\log x$

B. $\left(4x - 9x^2\right)\log x$

C. $\left(9x^2 + 4x\right)\log x$

D. none of these

Answer: A

Watch Video Solution

321. $\int_0^{\pi} e^{\sin^2 x} . \cos^3 x dx =$

A. minus 1

B. 0

C. 1

D. π

Answer: B

Watch Video Solution

322. The value of $\int_0^1 \frac{dx}{x+\sqrt{1-x^2}}dx$

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

B. π

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

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

Answer: D

Watch Video Solution

323. $\int_a^b \frac{\sqrt{x}dx}{\sqrt{x}+\sqrt{a+b-x}} =$

A. π

B. 2 (b-a)

C. 44228

D. $\frac{b-a}{2}$

Answer: B

Watch Video Solution

324. The value of $\int_2^3 \frac{x+1}{x^2(x-1)}dx =$

A. (log) 16/9+1/6

B. (log) 16/9-1/6

C. 2log2-1/6

D. (log) 4/3 -1/6

Answer: B

Watch Video Solution

325. If g(x) = (f(x)-f(-x))/2 defined over [-3,3] and $f(x) = 2x^2 - 4x + 1$, then $\int_{-3}^{3} g(x)dx =$

A. 0

B. 4

C. -4

D. 8

Answer: A

Watch Video Solution

326.

$$\int_{0}^{\frac{\pi}{4}} (\cos x - \sin x)dx + \int_{\frac{\pi}{4}}^{\frac{5\pi}{4}} (\sin x - \cos x)dx + \int_{2\pi}^{\frac{\pi}{4}} (\cos x - \sin x)dx =$$

A. $\sqrt{2}-2$

B. $2\sqrt{2}-2$

C. $3\sqrt{2}-2$

D. $4\sqrt{2}-2$

Answer: D

Watch Video Solution

327. The value of the integral $\int_0^{\infty} \log\left(x+\frac{1}{x}\right)\frac{dx}{x^2+1}$ is

A. $\pi \log 2$

B. $-\pi \log 2$

C. $\left(\frac{\pi}{2}\right)\log 2$

D. $-\left(\frac{\pi}{2}\right)\log 2$

Answer: A

Watch Video Solution

328. If $f: R \to R$ and $g: R \to R$ are one-to-one, real valued functions, then the value of the integral $\int_{-\pi}^{\pi} [f(x) + f(-x)][g(x) - g(-x)]dx =$

A. 0

B. π

C. 1

D. none of these

Answer: A

Watch Video Solution

329. If $\int_{\log 2}^{x} \frac{du}{(e^u - 1)^{\frac{1}{2}}} = \frac{\pi}{6}$, then $e^x =$

A. 1

B. 2

C. 4

D. minus 1

Answer: C

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330. The value of $\int_0^{\sin^2\theta} \sin^{-1}\sqrt{\phi}d\phi + \int_0^{\cos^2\theta} \cos^{-1}\sqrt{\phi}d\phi =$

A. π

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

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

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

Answer: D

Watch Video Solution

331. $\int_0^{10\pi} |\sin x| dx$ is

A. 20

B. 8

C. 10

D. 18

Answer: A

Watch Video Solution

332. $\int_{-\pi}^{\pi} \frac{2x(1+\sin x)}{1+\cos^2 x} dx$ is :

A. $\frac{\pi^2}{4}$

B. π^2

C. zero

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

Answer: B

Watch Video Solution

333. $\int_0^{\sqrt{2}} [x^2] dx =$, wher [x] is the greatest integer function

A. $2 - \sqrt{2}$

B. $2 + \sqrt{2}$

C. $\sqrt{2} - 1$

D. $-\sqrt{2} - \sqrt{3} + 5$

Answer: D

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334. If $P = \int_0^{3\pi} f(\cos^2 x) dx$ and $Q = \int_0^{\pi} f(\cos^2 x) dx$ then

A. P-Q = 0

B. P-2Q=0

C. P-3Q=0

D. P-5Q =0

Answer: C

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335. If $\int_0^1 \frac{x^7}{\sqrt{1-x^4}}dx =$

A. 1

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

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

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

Answer: B

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336. Let $I_1 = \int_a^{\pi - a} x f(\sin x) dx$, $I_2 = \int_a^{\pi - a} f(\sin x) dx$ then I_2 is equal to

A. $\frac{\pi}{2} I_1$

B. πI_1

C. $\frac{2}{\pi} I_1$

D. $2I_1$

Answer: C

Watch Video Solution

337. The value of the integral $\int_{\frac{1}{n}}^{\frac{(an-1)}{n}} \frac{\sqrt{x}}{\sqrt{a-x} + \sqrt{x}} dx$ is

A. a/2

B. (na+2)/(2n)

C. (na-2)/(2n)

D. none of these

Answer: C

Watch Video Solution

338. For any integer n, the integral : $\int_0^{\pi} e^{\cos^2} \cos^3(2n+1)x dx$ has the value :

A. π

B. 1

C. 0

D. none of these

Answer: C

Watch Video Solution

339. If f(x) =

A. 3

B. 44257

C. 44256

D. 0

Answer: C

View Text Solution

340. $\int_{\frac{\pi}{6}}^{\frac{\pi}{3}} \frac{dx}{1+\sqrt{\cot x}} =$

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

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

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

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

Answer: C

Watch Video Solution

341. $\int_{-\pi}^{\pi}(1-x^2)\sin x \cdot \cos^2 x \cdot dx$ is :

A. 0

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

C. $2\pi - \pi^3$

D. $\frac{7}{2} - 2\pi^3$

Answer: A

Watch Video Solution

342. If $\int_0^a f(2a-x)dx = \mu$ and $\int_0^a f(x)dx = \lambda$, then $\int_0^{2a} f(x)dx =$

A. $2\lambda - \mu$

B. $\lambda + \mu$

C. $\mu - \lambda$

D. $\lambda - 2\mu$

Answer: B

Watch Video Solution

343. If $U_n = \int_0^{\frac{\pi}{4}} \tan^n x dx$ then $u_n + u_{n-2} =$

A. 1/(n-1)

B. 1/(n+1)

C. 1/(2n-1)

D. 1/(2n+1)

Answer: A

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344. The value of $I = \int_0^1 x\left|x - \frac{1}{2}\right| dx$ is

A. 44256

B. 44287

C. 44409

D. none of these

Answer: C

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345. The value of $\int_2^8 |x - 5| dx$ is

A. 17

B. 12

C. 9

D. 18

Answer: A

View Text Solution

346. $\int_0^{\frac{\pi}{8}} \cos^3 4\theta d\theta =$

A. 0

B. 44411

C. 44259

D. π

Answer: C

Watch Video Solution

347. $\int_0^{\pi} \frac{x dx}{1+\sin x} =$

A. $-\pi$

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

C. π

D. none of these

Answer: C

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348. $\int_{-\frac{\pi}{3}}^{\frac{\pi}{3}} \frac{x \sin x}{\cos^2 x} dx =$

A. $\frac{1}{3}(4\pi + 1)$

B. $\frac{4\pi}{3} - 2 \log \tan\left(5\frac{\pi}{12}\right)$

C. $\frac{4\pi}{3} + \log \tan\left(\frac{5}{12}\right)$

D. none of these

Answer: B

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349. $\int_0^{\frac{\pi}{2}} x \sin^2 x . \cos^2 x dx =$

A. $\frac{\pi^2}{64}$

B. $\frac{\pi^2}{16}$

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

D. none of these

Answer: A

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350. If $\frac{1 \sin t}{1+t} dt = \alpha$, then that value of the integral : $\int_{4\pi-2}^{4\pi} \frac{\frac{\sin t}{2}}{4\pi + 2 - t} dt$ in terms of α is given by :

A. 2α

B. -2α

C. α

D. $-\alpha$

Answer: D

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351. $\lim_{n \to \infty} \sum_{r=0}^{n-1} \frac{1}{\sqrt{n^2 - r^2}} =$

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

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

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

D. π

Answer: C

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352. $\lim_{n \to \infty} \sum_{r=0}^{n-1} \frac{1}{n + r} =$

A. π

B. 0

C. log 2

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

Answer: C

Watch Video Solution

353. $\lim_{n \to \infty} n. \sum_{r=0}^{n-1} \frac{1}{n^2 + r^2} =$

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

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

C. 0

D. log2

Answer: A

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354. $\lim_{n \to \infty} \left[\frac{1}{n^2} \sec^2 \frac{1}{n^2} + \frac{2}{n^2} \sec^2 \frac{4}{n^2} + \ldots\ldots + \frac{1}{n} \sec^2 1 \right]$ equals :

A. 1/2 cosec 1

B. 1/2 sec 1

C. 1/2 tan 1

D. tan 1

Answer: C

Watch Video Solution

355. $\lim_{n \to \infty} \sum_{r=1}^{n} \frac{1}{n} e^{\frac{r}{n}}$ is :

A. e

B. e-1

C. 1-e

D. e+1

Answer: B

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356. $\lim_{n \to \infty} \left[\frac{1}{2n+1} + \frac{1}{2n+2} + \ldots\ldots + \frac{1}{2n+n} \right] =$

A. $\log_e \left(\frac{1}{3} \right)$

B. $\log_e \left(\frac{2}{3} \right)$

C. $\log_e \left(\frac{3}{2} \right)$

D. $\log_e \left(\frac{4}{3} \right)$

Answer: C

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357. $\lim_{n \to \infty} \left[\frac{1}{n+1} + \frac{1}{n+2} + \ldots\ldots + \frac{1}{2n} \right] =$

A. log2

B. log 3

C. log 4

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

Answer: A

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358. $\lim_{n \to \infty} \left[\frac{n+1}{n^2+1^2} + \frac{n+2}{n^2+2^2} + \frac{n^+3}{n^2+3^2} + ... \frac{.1}{n} \right] =$

A. $\frac{\pi}{4} + \frac{1}{2}\log 2$

B. $\frac{\pi}{2} + \frac{1}{4}\log 2$

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

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

Answer: A

Watch Video Solution

359. The value of $\int_{-2}^{2}\left(ax^3+bx+c\right)$ dx depends on the

A. value of c

B. value of b

C. values of a and b

D. valur of a

Answer: A

Watch Video Solution

360. If $f(x)=\int_{-1}^{x}|t|dt$, then for any $x\geq 0$, $f(x)=$

A. $1+x^2$

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

C. $1-x^2$

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

Answer: D

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361. $\int_1^3 \frac{\sqrt{4-x}}{\sqrt{x}+\sqrt{4-x}}dx =$

A. 2

B. 0

C. 1

D. 3

Answer: C

Watch Video Solution

362. The area bounded by the curve $y = \begin{cases} x^2x < 0 \\ x \geq 0 \end{cases}$ and the line y =4 is

A. 44271

B. 40/3

C. 44263

D. 32/3

Answer: B

View Text Solution

363. $\int_0^1 x\frac{(1-x)^{93}}{2}\Big)dx =$

A. -8/35

B. 24/35

C. 17860

D. -24/35

Answer: C

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364. $\int_0^{\pi/4} \frac{\sin x + \cos x}{3 + \sin 2x} dx =$

A. 2 log 3

B. 1/2 log 3

C. log 3

D. 1/4 log 3

Answer: D

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365. The value of $\int_0^4 |x - 1| dx$ is

A. 44232

B. 5

C. 4

D. 1

Answer: B

View Text Solution

366. If $I_n \int_0^{\pi/4} \tan^n x \, dx$, where n is a positive interger, then $I_{10} + I_8$ is

A. 44440

B. 44409

C. 44378

D. 9

Answer: A

Watch Video Solution

367. The interval I such that $\int_0^1 \frac{dx}{\sqrt{1+x^4}} \in I$ is given by :

A. $\left(0, \frac{1}{\sqrt{2}}\right)$

B. $\left[\frac{1}{\sqrt{2}}, 1\right]$

C. $\left[\sqrt{2}, 2\right]$

D. `[sqrt2,7/4]

Answer: B

Watch Video Solution

368. $\int_0^{\pi/2} \log(\tan x)dx$ =

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

B. 0

C. 1

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

Answer: B

Watch Video Solution

369. $\int_0^1 (x^4 + 2x^2 + 1) d(x^2 + 1) =$

A. 44260

B. 44262

C. 44256

D. 28/15

Answer: B

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370. $\int_1^{e^{17/2}} \frac{\cos(\pi \log x)}{x} dx =$

A. 0

B. minus 1

C. 2

D. 1

Answer: D

Watch Video Solution

371. $\int_0^{2a} \frac{f(x)}{f(x)+f(2a-x)}dx =$

A. 2a

B. a

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

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

Answer: B

Watch Video Solution

372. The value of $\int_{-\frac{1}{2}}^{\frac{1}{2}} (\cos x).\log\left(\frac{1-x}{1+x}\right)dx$ is

A. 0

B. $\sqrt{e}$

C. 1

D. $2\sqrt{e}$

Answer: A

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373. $\int_0^{\frac{\pi}{8}} \tan^2(2x)dx =$

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

B. $\frac{4+\pi}{8}$

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

D. $\frac{4-\pi}{2}$

Answer: A

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374. If $\int_0^x f(t)dt = x + \int_x^l tf(t)dt$, then the value of $f(1)$ is :

A. 0

B. 44228

C. 1

D. 4

Answer: B

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375. Let $f: (0, \infty) \to R$ and $F(x) = \int_0^x f(t)dt.$

If $F\left(x^2\right) = x^2(1 + x)$, then $f(4)$ equals :

A. 1

B. 2

C. 3

D. 4

Answer: D

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376. $\lim_{n \to \infty} \frac{1}{n} \sum_{r=1}^{2n} \frac{r}{s} que^{n^2 + \sqrt[2]{}}$ equals

A. $1 + \sqrt{5}$

B. $-1 + \sqrt{5}$

C. $-1 + \sqrt{2}$

D. $1 + \sqrt{2}$

Answer: B

View Text Solution

View Text Solution

377. The value of the integral $\int_0^{\pi} \frac{x \sin^{2n} x}{\sin^{2n} x + \cos^{2n} x} dx$ is :

A. π

B. 2π

C. π^2

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

Answer: C

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378. Let $f(x) = x - [x]$, for every real number x, where [x] is integral part of x. Then $\int_{-1}^{1} f(x)dx$ is:

A. 1

B. 2

C. 0

D. 44228

Answer: A

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379. $\int_{\pi/4}^{3\pi/4} \frac{dx}{1+\cos x}$ is equal to :

A. 2

B. minus 2

C. 44228

D. minus 1/2

Answer: A

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380. Let $f(x) = \int_1^x \sqrt{2 - t^2} dt$. Then the real roots of the equation $x^2 - f'(x) = 0$ are :

A. ± 1

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

C. $\pm \frac{1}{2}$

D. 0 and 1

Answer: A

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381. The integral $\int_{-\frac{1}{2}}^{\frac{1}{2}} \left\{ [x] + \log\left(\frac{1+x}{1-x} \right) \right\} dx$ equals

A. minus 1/2

B. 0

C. 1

D. 2 log (1/2)

Answer: A

View Text Solution

382. The value of $\frac{5050\int_0^1 \left(1-x^{50}\right)^{100}dx}{\int_0^1 \left(1-x^{50}\right)^{101}dx}$ is

A. 5049

B. 5051

C. 5050

D. none of these

Answer: B

View Text Solution

383. $\lim_{x \to \frac{\pi}{4}} \frac{\int_2^{\sec^2 x} f(t)dt}{x^2 - \frac{\pi^2}{16}}$ equals

A. $\frac{8}{\pi} f(2)$

B. $\frac{2}{\pi} f(2)$

C. `2/pi f(1/2)

D. 4f(2)

Answer: A

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384. The values of $\lim_{x \to 0} \frac{1}{x^3} \int_0^x \frac{tIn(1+t)}{t^4+4} dt$ is :

A. 0

B. 44531

C. 45292

D. 23377

Answer: B

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385. $\lim_{n \to \infty} \left\{ \frac{1^m + 2^m + 3^m + \ldots\ldots + n^m}{n^{m+1}} \right\}$ equals

A. 1/(m+1)

B. 1/(m+2)

C. 1/n

D. none of these

Answer: A

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386. If $I_1 = \int_0^1 2^{x^2} dx, I_2 = \int_0^1 2^{x^3} dx, I_3 = \int_1^2 2^{x^2} dx, I_4 = \int_1^2 2^{x^3} dx$ then,

A. $I_1 > I_2$ and $I_4 > I_3$

B. $I_2 > I_1$ and $I_3 > I_4$

C. $I_1 > I_2$ and $I_3 > I_4$

D. none of these

Answer: A

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387. The value of the integral, $\int_3^6 \frac{\sqrt{x}}{\sqrt{9-x}+\sqrt{x}} dx$ is :

A. 44228

B. 44230

C. 2

D. 1

Answer: B

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388. The solution for x of the equation : $\int_{\sqrt{2}}^{x} \frac{dt}{t\sqrt{t^2-1}} = \frac{\pi}{2}$ is :

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

B. $2\sqrt{2}$

C. 2

D. $-\sqrt{2}$

Answer: D

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389. Let $I = \int_0^1 \frac{\sin x}{\sqrt{x}} dx$ and $J = \int_0^1 \frac{\cos x}{\sqrt{x}} dx$. Then which of the following is true?

A. $I > \frac{2}{3}, j > 2$

B. I lt 2/3, j lt 2`

C. $I < \frac{2}{3}, J > 2$

D. $I > \frac{2}{3}, J < 2$

Answer: B

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390. $\int_0^{\pi} [\cot x] dx$, when $[\cdot]$ denotes the greatest integer function, is equal to :

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

B. 1

C. minus 1

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

Answer: D

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391. $\int_{-2}^{2} |x| dx =$

A. 1

B. 2

C. 3

D. 4

Answer: D

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392. If $\int_{0}^{a} \frac{1}{1+4x^2} dx = \frac{\pi}{8}$ then a =

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

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

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

D. 44228

Answer: D

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393. $\int_0^{2\pi} e^{\frac{x}{2}} \sin\left(\frac{x}{2} + \frac{\pi}{4}\right) dx =$

A. 2π

B. e^{π}

C. 0

D. $2\sqrt{2}$

Answer: C

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394. The value of the integral $\int_0^{3\alpha} \cos ec(x - \alpha)\cos ec(x - 2\alpha)dx$ is

A. $2\sec\alpha \log\left(\frac{1}{2}\cos ec\alpha\right)$

B. $2\sec\alpha\log\left(\frac{1}{2}\sec\alpha\right)$

C. $2\cos ec\alpha\log(\sec\alpha)$

D. $2\cos ec\alpha\log\left(\frac{1}{2}\sec\alpha\right)$

Answer: D

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395. $\lim_{n\to\infty}\left\{\frac{n}{n^2+1^2}+\frac{n}{n^2+2^2}+.....+\frac{n}{n^2+n^2}\right\}$ is equal to

A. 1

B. 0

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

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

Answer: C

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396. The value of the integral $\int_0^{\frac{\pi}{4}} \frac{\sin\theta + \cos\theta}{9 + 16\sin 2\theta} d\theta$ is

A. log 3

B. log2

C. 1/20 log 3

D. 1/20 log 2

Answer: C

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397. $\int_0^{1/2} |\sin \pi x| dx$ is equal to :

A. 0

B. π

C. $-\pi$

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

Answer: D

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398. The value of $\int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} \left| x \cos\left(\frac{\pi x}{2}\right) \right| dx$ is

A. $\frac{\pi\sqrt{2} + 4\sqrt{2} - 8}{\pi^2}$

B. $\frac{\sqrt{2} + 4\pi\sqrt{2} - 8}{\pi^2}$

C. $\frac{\pi\sqrt{2} + 4\sqrt{2} + 8}{\pi^2}$

D. none of these

Answer: A

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399. For any integer n, the integral : $\int_0^{\pi} e^{\cos^2} \cos^3(2n+1)x dx$ has the value :

A. π

B. 1

C. 0

D. none of these

Answer: C

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400. If $g(x) = \int_0^x \cos^4 t dt$, then $g(x+\pi)$ equals:

A. $g(x) + g(\pi)$

B. $g(x) - g(\pi)$

C. $f(x)g(\pi)$

D. $\frac{g(x)}{g(\pi)}$

Answer: A

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401. If $I_n = \int_0^{\frac{\pi}{4}} \tan^n \theta d\theta$, then $I_8 + I_6$ equals

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

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

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

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

Answer: D

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402. The value of $\int_0^{\frac{\pi}{2}} \frac{1}{1+\tan^3 x} dx$ is

A. 0

B. 1

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

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

Answer: D

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403. Let $f: R \to R$ and $g: R \to R$ be continuous functions. Then the value of :

$\int_{-\pi/2}^{\pi/2} [f(x) + f(-x)][g(x) - g(-x)]dx$ is :

A. π

B. 1

C. minus 1

D. 0

Answer: D

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404. If $f(a+b-x) = fx$, then $\int_a^b xf(x)dx$ is equal to :

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

B. $\frac{1}{2}(a+b)\int_a^b f(x)dx$

C. $(b-a)\int_a^b f(x)dx$

D. $\frac{1}{2}(b-a)\int_a^b f(x)dx$

Answer: B

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405. $\int_0^{\frac{\pi}{2}} \frac{dx}{1+\cot x} =$

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

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

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

D. π

Answer: A

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406. If f and g are continuous [0,a) satisfying f(x) = f(a-x) and g(x)+ g(a-x) = 2 then, $\int_0^a f(x)g(x)dx =$

A. $\int_0^a g(x)dx$

B. $\int_0^a f(x)dx$

C. 0

D. none of these

Answer: B

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407. $\int_0^3 |x^3 + x^2 + 3x|dx$ is equal to

A. 171/2

B. 171/4

C. 170/4

D. 170/3

Answer: B

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408. $\int_0^{10} |x(x-1)(x-2)|dx$ is equal to

A. 160.05

B. 1600.5

C. 16.005

D. none of these

Answer: B

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409. If $I = \int_0^{\frac{\pi}{4}} \log(1 + \tan x)dx$, then I =

A. $\frac{\pi}{8}\log_e 2$

B. $\frac{\pi}{4}\log_e 2$

C. $-\frac{\pi}{8}\log_e 2$

D. $-\frac{\pi}{4}\log_e 2$

Answer: A

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410. $\lim_{n\to\infty}\left\{\frac{1}{n}+\frac{1}{n+1}+\frac{1}{n+2}+\ldots..+\frac{1}{3n}\right\} =$

A. log2

B. log 3

C. log 5

D. 0

Answer: B

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411. If $I = \int_{-\pi}^{\pi} \frac{e^{\sin x}}{e^{\sin x} - e^{-\sin x}} dx$ then I =

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

B. 2π

C. π

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

Answer: C

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412. $\lim_{x \to \infty} \frac{\int_0^{2x} xe^2 dx}{e^{4x^2}}$ equals :

A. 0

B. 2

C. 44228

D. ∞

Answer: C

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413. The value of $\int_{-2}^{2}\left\{p\log\left(\frac{1+x}{1-x}\right)+q\log\left(\frac{1-x}{1+x}\right)^{-2}+r\right\}$ depends on the value of

A. p

B. q

C. r

D. p and q

Answer: C

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414. $\int_a^b \frac{|x|}{x} dx, (Where 0 < a < b) =$

A. |a|-|b|

B. |b|-|a|

C. |a|-b

D. |b|-a

Answer: B

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415. The area of the region bounded by the curve $y^2 = 8x$ and the line $y = 2x$ is

A. 44259

B. 44289

C. 44287

D. 44228

Answer: A

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416. The area bounded by $y = 4x - x^2$ and x-axis is

A. 44332

B. 32/3

C. 64/3

D. none of these

Answer: B

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417. $\int_1^3 (x-1)(x-2)(x-3)dx =$

A. 3

B. 2

C. 1

D. 0

Answer: D

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

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419. Area bounded by y = log x, the x-axis and the line x=2 is

A. log 2

B. 2

C. 44230

D. 2log 2-1

Answer: D

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420. The area enclosed between the parabolas $y^2 = 4x$ and $x^2 = 4y$ is

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

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

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

D. 0

Answer: C

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421. The area bounded by the curve y = log x, the x-axis and the line x=e is given by

A. 1+1/e

B. e

C. 1

D. 1-1/e

Answer: C

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422. The area enclosed between the curves y = x^3 and $y = \sqrt{x}$ is, (in square units)

A. 44260

B. 44291

C. 44535

D. 44328

Answer: C

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423. The area enclosed between the parabola $y = x^2 - x + 2$ and the line $y = x + 2$ in sq. units equals

A. 44259

B. 44257

C. 44256

D. 44263

Answer: A

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424. The area bounded by the curve $y = 2x - x^2$ and the st.line y=-x is given by :

A. 44236

B. 43/6

C. 35/6

D. none of these

Answer: A

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425. The area of the region bounded by the curves : y=|x-2|, x=1,x=3 and the x-axis is :

A. 1

B. 2

C. 3

D. 4

Answer: A

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426. Let f(x) be a non-negative continuous function such that the area bounded by the curve y=f(x), x-axis and the ordinates $x = \frac{\pi}{4}$ and $x = \beta > \frac{\pi}{4}$ is :
$\left(\beta \sin \beta + \frac{\pi}{4}\cos \beta + \sqrt{2}\beta\right)$.
Then $f\left(\frac{\pi}{2}\right)$ is :

A. $\frac{\pi}{2} - \sqrt{2} + 1$

B. $\frac{\pi}{2} + \sqrt{2} - 1$

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

D. $1 - \frac{\pi}{4} - \sqrt{2}$

Answer: C

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427. The area enclosed between the curve $y = \log_e(x + e)$ and the coordinate axes is :

A. 2

B. 1

C. 4

D. 3

Answer: B

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428. 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 respectively the areas of these parts numbered from top to bottom , then $S_1 : S_2 : S_3$ is :

A. 0.043090277777778

B. 0.04306712962963

C. 0.042372685185185

D. 0.084050925925926

Answer: C

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429. Area bounded by the curves : $y = \sqrt{x}, x = 2y + 3$ in the first quadrant and x-axis is :

A. $2\sqrt{3}$

B. 18

C. 9

D. 34/3

Answer: C

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430. Area enclosed between curves : $y = ax^2$ and $x = ay^2$ (a > 0) is 1 sq. unit, then a is :

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

B. 44228

C. 1

D. 44256

Answer: A

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431. The area of the region bounded by the curve $y^2 = 8x$ and the line $y = 2x$ is

A. 44259

B. 44289

C. 44287

D. 44228

Answer: A

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432. The area of the segment cut off from the parabola $x^2 = 8y$ by the line x-2y+8=0 (in square units) is

A. 12

B. 24

C. 48

D. 36

Answer: D

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433. AOB is the positive quadrant of the ellipse $\frac{X^2}{a^2}+\frac{y^2}{b^2}=1$, where OA =a, OB =b. The area between the arc AB and the chord AB of the ellipsed is

A. πab

B. $(\pi-2)ab$

C. $\frac{ab(\pi-2)}{2}$

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

Answer: D

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434. The area (in square units) bounded by the x-axis part of the curve $y=1+\frac{8}{x^2}$ and the line x=2 and x=4

A. 2

B. 3

C. 4

D. 5

Answer: C

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435. Area bounded by y=3x and $y = x^2$ is

A. 10

B. 5

C. 4.5

D. 9

Answer: C

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

A. 11749

B. 32/3

C. 33/2

D. 44271

Answer: B

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437. The area bounded by the curves $y = x^3$ and $y = x^2$ and the ordinates x=1, x=2 is

A. $\frac{17}{12}$

B. $\frac{12}{13}$

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

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

Answer: A

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438. The area (in square units) of the region bounded by the curve $x^2 = 4y$, the line $x = 2$ and x-axis is

A. 1

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

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

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

Answer: B

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439. The area bounded by $y = x^2 + 2$, x-axis, x=1 and x=2 is

A. $\frac{13}{3}$

B. 44272

C. 44268

D. 44275

Answer: C

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440. the area of the region bounded by $y = 2x - x^2$ and x-axis is

A. 44263

B. 44271

C. 32/3

D. 64/3

Answer: B

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441. the area of the region bounded by $y = 2x - x^2$ and x-axis is

A. 4/3 sq.units

B. 8/3 sq.units

C. 2/3 sq.units

D. 7/3 sq.units

Answer: A

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442. The area bounded betwene the parabola $y^2 = 4x$s and the line $y = 2x - 4$ is equal to

A. 9.sq.units

B. 15 sq. units

C. 17/3 sq.units

D. 19/3 sq.units

Answer: A

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443. The area of the region bounded by the curves $y = x^2$ and $y = 4x - x^2$ in sq units is

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

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

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

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

Answer: B

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444. The area of the region enclosed between the curves $y = x^3$ and $y = \sqrt{x}$ is

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

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

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

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

Answer: C

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445. The area of the region bounded by y=|x-1| and y=1 is

A. 1

B. 2

C. 44228

D. 44230

Answer: A

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446. 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 $x = 1$

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

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

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

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

Answer: A

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

A. 1

B. 2

C. $2\sqrt{2}$

D. 4

Answer: B

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448. The area enclosed between the curves, $y = ax^2$ and $x = ay^2 (a > 0)$ is 1 square units, then the value of a is

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

B. 44228

C. 1

D. 44256

Answer: A

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449. If y= f(x) makes positive intercepts of 2 and 1 unit on x and y coordinate axes and encloses an area of 3/4 square unit with the axes then `int_0^(2) d^(')(x) dx is

A. 44230

B. 1

C. 44291

D. minus 3/4

Answer: D

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450. The area enclosed between the curve $y = \log_e(x + e)$ and the coordinate axes is :

A. 4

B. 3

C. 2

D. 1

Answer: D

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451. The area enclosed between the curves : $y^2 = x$ and y=|x| is :

A. 44348

B. 44256

C. 44257

D. 1

Answer: B

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452. The area of the figure bounded by y=sin x , y cos x in the first quadrant is :

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

B. $\sqrt{3}+1$

C. $2\left(\sqrt{3}-1\right)$

D. none of these

Answer: A

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453. The area enclosed between the curves y=x and $y=2x-x^2$ is (in square unit)

A. 1/2

B. 1/6

C. 1/3

D. 1/4

Answer: B