MATHS

BOOKS - RD SHARMA MATHS (HINGLISH)

DEFINITE INTEGRALS

Solved Examples And Exercises

1. Evaluate : $\int_0^{\frac{\pi}{6}} \cos x \cos 2x dx$

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2. Evaluate : $\int_0^{\frac{\pi}{2}} \cos^3 x dx$

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3. Evaluate : $\int_0^{\frac{\pi}{4}} \sec x dx$

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

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

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6. Evaluate : $\int_{-2}^{3} \frac{1}{x+7} dx$

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7. Evaluate : $\int_0^{\pi} \frac{1}{1+\sin x} dx$

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8. Evaluate : $\int_1^4 \frac{x^2+x}{\sqrt{2x+1}} dx$

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9. Evaluate : $\int_0^1 x(1-x)^5 dx$

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10. Evaluate : $\int_1^2 \left(\frac{x-1}{x^2}\right) e^x dx$

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11. Evaluate : $\int_0^1 \sqrt{x(1-x)}dx$

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12. Evaluate : $\int_0^1 \frac{1}{\sqrt{3+2x-x^2}}dx$

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13. Evaluate : $\int_0^{\frac{\pi}{4}} (\tan x + \cot x)^{-2}dx$

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14. Evaluate : $\int_0^1 \left(xe^x + \frac{\sin(\pi x)}{4}\right)dx$

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15. Evaluate : $\int_0^1 \frac{1}{1+2x+2x^2+2x^3+x^4}dx$

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16. Evaluate : $\int_0^1 x\log(1+2x)dx$

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17. Evaluate : $\int_2^3 \frac{x}{x^2+1}dx$

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18. Evaluate : $\int_0^\infty e^{-x}dx$

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19. Evaluate : $\int_0^{\frac{\pi}{2}} x^2 \sin x dx$

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20. Evaluate : $\int_4^9 \frac{1}{\sqrt{x}} dx$

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21. Evaluate : $\int_0^{\frac{\pi}{2}} \sqrt{1+\sin x} dx$

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22. Evaluate : $\int_0^{\frac{1}{2}} \frac{1}{\sqrt{1-x^2}} dx$

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23. Evaluate : $\int_0^1 \frac{1}{1+x^2} dx$

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24. Evaluate : $\int_0^{\pi} \frac{x}{\left(a^2 \cos^2 x + b^2 \sin^2 x\right)^2} dx$

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25. Evaluate : $\int_0^{\infty} \frac{1}{a^2 + b^2 x^2} dx$

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26. Evaluate : $\int_{\frac{\pi}{3}}^{\frac{\pi}{4}} (\tan x + \cot x)^2 dx$

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27. Evaluate : $\int_1^e \frac{\log x}{x} dx$

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28. Evaluate : $\int_0^{2\pi} e^x \cos\left(\frac{\pi}{4} + \frac{x}{2}\right) dx$

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29. Evaluate : $\int_1^2 \frac{x+3}{x(x+2)} dx$

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30. Evaluate : $\int_e^{e^2} \left\{\frac{1}{\log x} - \frac{1}{(\log x)^2}\right\} dx$

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31. If $\int_0^k \frac{1}{2+8x^2}dx = \frac{\pi}{16}$, find the value of $2k$

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32. Evaluate: $\int_{-\pi}^{\pi} \left((2x)\frac{1+\sin x}{1+\cos^2 x}\right)dx$

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33. Evaluate: $\int_{-1}^{1} \frac{x^3+|x|+1}{x^2+2|x|+1}dx$

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34. $\int_0^1 \log\left(\frac{1}{x}-1\right)dx$ is equal to

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

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36. Prove that: $\int_0^{\pi/2} \frac{\sin x}{\sin x - \cos x} dx = \frac{\pi}{4}$

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37. Prove that: $\int_0^{2a} f(x)dx = \int_0^{2a} f(2a-x)dx.$

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38. Evaluate: $\int_{-\pi/4}^{\pi/4} x^3 \sin^4 x dx$ (ii) $\int_a^a \sqrt{\frac{a-x}{a+x}} dx$

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39. Evaluate: $\int_{\pi/4}^{\pi/4} \frac{x+\pi/4}{2-\cos 2x}dx$

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

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41. Prove that: $\int_0^{\pi} \frac{x}{1+\cos\alpha\sin x}dx = \frac{\pi\alpha}{\sin\alpha}$

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42. Evaluate the following integrals: (1-35) $\int_{-a}^{a} \log\left(\frac{a-\sin\theta}{a+\sin\theta}\right)d\theta, a>0$

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43. Evaluate the following integrals: $\int_{-1}^{1} |x \cos \pi x| dx$

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44. Evaluate the following integrals: (1-35) $\int_{0}^{\pi} \left(\frac{x}{1+\sin^2 x} + \cos^7 x \right) dx$

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45. Evaluate : $\int_{0}^{\pi} \frac{x}{1+\sin \alpha \sin x} dx$

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46. Evaluate the following integrals: (1-35) $\int_{0}^{\pi/2} \frac{a \sin x + b \cos x}{\sin x + \cos x} dx$

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47. Evaluate the following integral as limit of sums: $\int_0^2 (x+4)dx$

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48. Evaluate $\int_1^4 \left(x^2 - x\right) dx$ as a limit of sums.

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49. Evaluate: $\int_a^b \sin x dx$ using limit of sum

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50. Mark the correct alternative in each of the following:

$\int_0^1 \sqrt{x(1-x)}dx$ equals $\pi/2$ (b) $\pi/4$ (c) $\pi/6$ (d) $\pi/8$

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51. Evaluate : $\int_0^{\pi} \frac{1}{1+\sin x} dx$

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52. If $\int_0^a \sqrt{x} dx = 2a \int_0^{\pi/2} \sin^3 x dx$ find the value of integral $\int_a^{a+1} x dx$.

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53. Evaluate: (i) $\int_0^4 \frac{1}{\sqrt{x^2+2x+3}} dx$

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54. If $\int_0^1 (3x^2+2x+k) dx = 0$, find the value of k.

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55. If $\int_1^a (3x^2+2x+1) dx = 11$ then the value of a is

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56. If $\int_a^b x^3 dx = 0$, and If $\int_a^b x^2 dx = \frac{2}{3}$, find a and b.

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57. Evaluate: $\int_0^{\pi/2} \sqrt{1 - \cos 2x} dx$.

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58. Evaluate: $\int_0^{\pi/2} \sin^4 x dx$

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59. Evaluate: $\int_0^{\pi/4} \sqrt{1 + \sin 2x} dx$ (ii) $\int_0^{\pi/4} \sqrt{1 - \sin 2x} dx$

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60. Evaluate: $\int_{\pi/4}^{\pi/2} \sqrt{1-\sin 2x}\,dx$

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61. Evaluate the following integrals: (1-35) $\int_{-2}^{2} \frac{3x^3+2|x|+1}{x^2+|x|+1}dx$

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62. Evaluate the following integrals: (1-35) $\int_{0}^{\pi} x \sin x \cos^2 x\,dx$

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63. Show that: $\int_{0}^{\pi/2} f(\sin 2x)\sin x\,dx = \sqrt{2}\int_{0}^{\pi/4} f(\cos 2x)\cos x\,dx.$

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64. For $x > 0, let f(x) = \int_1^x \frac{(\log)_e t}{1+t} dt$. Find the function $f(x) + f\left(\frac{1}{x}\right)$ and show that $f(e) + f\left(\frac{1}{e}\right) = \frac{1}{2}$.

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65. Evaluate the following integrals: (1-35) $\int_0^{\pi/2} \frac{\sin^n x}{\sin^n + \cos^n x} dx$

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66. Prove that: $\int_0^{2\pi} \frac{x \sin^{2n} x}{\sin^{2n} + \cos^{2n} x} dx = \pi^2$

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67. Prove that: $\int_0^{\pi/2} \log|\tan x + \cot x| dx = \pi(\log)_e 2$

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68. Evaluate: $\int_{-2}^{2} |x \cos \pi x| dx$

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69. Evaluate: $\int_{\pi/4}^{\pi/4} \log(\sin x + \cos x) dx$

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70. Evaluate: $\int_{0}^{\pi} x \log \sin x dx$

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71. If $\int_{0}^{\pi} \frac{1}{a + b \cos x} dx = \frac{\pi}{\sqrt{a^2 - b^2}}$, then $\int_{0}^{\pi} \frac{1}{(a + b \cos x)^2} dx$ is

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72. $\int_{0}^{1} \sqrt{\frac{1 - x}{1 + x}} dx =$ $\frac{\pi}{2}$ (b) $\frac{\pi}{2} - 1$ (c) $\frac{\pi}{2} + 1$ (d) $\pi + 1$

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73. $\int_0^{\pi/2} \frac{\cos x}{(2+\sin x)(1+\sin x)} dx$ equals (a)$\log\left(\frac{2}{3}\right)$ (b) $\log\left(\frac{3}{2}\right)$ (c) $\log\left(\frac{3}{4}\right)$ (d) $\log\left(\frac{4}{3}\right)$

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74. $\int_0^{\pi} \frac{x \tan x}{\sec x + \cos x} dx is \frac{\pi^2}{4}$ (b) $\frac{\pi^2}{2}$ (c) $\frac{3\pi^2}{2}$ (d) $\frac{\pi^2}{3}$

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75. $\int_0^2 \frac{1}{1+\tan x} dx$ is equal to $\frac{\pi^{\square}}{4}$ (b) $\frac{\pi^{\square}}{3}$ (c) $\frac{\pi^{\square}}{2}$ (d) π

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76. $\int_{-\pi/2}^{\pi/2} \sin|x| dx$ is equal to 1 (b) 2 (c) -1 (d) -2

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77. The value of the integral $\int_0^{\infty} \frac{x}{(1+x)(1+x^2)}dx$ is $\frac{\pi}{2}$ (b) $\frac{\pi}{4}$ (c) $\frac{\pi}{6}$ (d) $\frac{\pi}{3}$

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78. $\int_0^3 \frac{3x+1}{x^2+9}dx$ = $\frac{\pi}{12}+\log\left(2\sqrt{2}\right)$ (b) $\frac{\pi}{2}+\log\left(2\sqrt{2}\right)$ (c) $\frac{\pi}{6}+\log\left(2\sqrt{2}\right)$ (d) $\frac{\pi}{3}+\log\left(2\sqrt{2}\right)$

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79. $I_{10}=\int_0^{\frac{\pi}{2}} x^{10}\sin x dx$ then $I_{10}+90I_8$ is (A) $10\left(\frac{\pi}{2}\right)^6$ (B) $10\left(\frac{\pi}{2}\right)^9$ (C) $10\left(\frac{\pi}{2}\right)^8$ (D) $10\left(\frac{\pi}{2}\right)^7$

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

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81. Evaluate: $\int_0^{\pi/2} \frac{1}{3+2\cos x} dx$

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82. Evaluate: $\int_{\pi/4}^{\pi/2} \cos 2x \log \sin x dx$

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83. integrate $\int_0^{2\pi} e^x . \sin\left(\frac{\pi}{4}+\frac{x}{2}\right) dx$

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84. Evaluate: $\int_0^1 \frac{2x}{5x^2+1}dx$

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85. Evaluate:(i) $\int_0^{\pi/6} (2+3x^2)dx$

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86. Evaluate: (i) $\int_0^4 \frac{1}{x+\sqrt{x}}dx$ (ii) $\int_0^1 \frac{2x}{5x^2+1}dx$

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87. Evaluate the following definite integrals (1-58):

$\int_1^2 \frac{1}{\sqrt{(x-1)(2-x)}}dx$

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88. If (x) is of the form $f(x) = a + bx + cx^2$, show that $\int_0^1 f(x)dx = \frac{1}{6}\left\{f(0) + 4f\left(\frac{1}{2}\right) + f(1)\right\}$

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89. Evaluate: $\int_0^\infty \frac{1}{(x^2 + a^2)(x^2 + b^2)}dx$.

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90. Evaluate the following integrals: $\int_0^{\pi/6} \cos^{-3} 2\theta \sin 2\theta d\theta$

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91. Evaluate the following integrals: $\int_0^{(\pi)^{2/3}} \sqrt{x}\cos^2 x^{3/2}dx$

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92. Evaluate the following integrals: $\int_0^1 \frac{24x^3}{(1+x^2)^4}dx$

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93. Evaluate the following integrals: $\int_0^1 \sqrt{\frac{1-x}{1+x}}dx$

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94. If $I_n = \int_0^{\pi/4} \tan^n x dx$, prove that $I_n + I_{n-2} = \frac{1}{n-1}$.

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95. If $I_n = \int_0^{\pi/4} \tan^n x dx$, show that $\frac{1}{I_2+I_4}, \frac{1}{I_3+I_5}, \frac{1}{I_4+I_6}, \frac{1}{I_5+I_7}$, form an A.P. Find the common difference of this progression.

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96. Evaluate: $\int_0^{\pi/2} \frac{1}{\left(a^2\cos^2 x + b^2\sin^2 x\right)^2} dx$

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97. Evaluate: $\int_0^1 x\left(\tan^{-1} x\right)^2 dx$

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98. Evaluate: $\int_0^a \frac{1}{(x^2+a^2)} dx$ (ii) $\int_0^\infty \frac{x^2}{(a^2+x^2)^{5/2}} dx$

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99. Evaluate: $\int_0^1 x\sqrt{\frac{1-x^2}{1+x^2}} dx$

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100. Evaluate the following integrals: $\int_0^a (\sin)^{-1} \sqrt{\frac{x}{a+x}} dx$

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101. Evaluate the following integrals: $\int_1^2 \frac{1}{x(1+\log x)^2} dx$

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102. Evaluate the following integrals: $\int_0^{\pi/4} \frac{\sin^2 x \cos^2 x}{\left(\sin^3 x + \cos^3 x\right)^2} dx$

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103. Evaluate the following integrals: $\int_0^{\pi/2} \frac{\tan x}{1+m^2 \tan^2 x} dx$

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104. Evaluate: $\int_0^1 |5x-3|dx$

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105. Evaluate:

$(i) \int_{-1}^{1} f(x)dx, where, f(x) = \{1-2x, x \leq 0; 1+2x, x \geq 0\},$

$(ii) \int_{-1}^{4} f(x)dx, where, f(x) = \{2x+8, -1 \leq x \leq 2; 6x, 2 \leq x \leq 4\}$

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106. $\int_{\frac{1}{e}}^{e} |\log x|dx$ =

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107. If $a > 0$, find $\int_0^{3a} |x^2 - a^2|dx$.

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108. If $[.]$ denotes the greatest integer function, then find the value of $\int_1^2 [3x]dx$

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109. Evaluate: $\int_0^3 [x]dx$

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110. $\int_0^1 \frac{d}{dx}\left\{\sin^{-1}\left(\frac{2x}{1+x^2}\right)\right\}dx$ is equal to 0 (b) π (c) $\pi/2$ (d) $\pi/4$

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111. Evaluate the following integrals: $\int_{-a}^{a} \frac{xe^{x^2}}{1+x^2}dx$

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112. Evaluate the following integrals: $\int_0^{\pi/4} |\cos 2x| dx$

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113. Evaluate the following integrals:

$\int_{-5}^{0} f(x)dx, where f(x) = |x| + |x+2| + |x+5|$

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114. Evaluate the following definite integrals (1-58):

$\int_1^2 \frac{1}{\sqrt{(x-1)(2-x)}} dx$

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115. Evaluate the following integrals: $\int_0^{\pi} \cos x |\cos x| dx$

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116. Let $f(x) = x - [x],$ for ever real number x, $where [x]$ is the greatest integer less than or equal to x. Then, evaluate $\int_{-1}^{1} f(x)dx$.

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117. Evaluate: $\int_0^{\sqrt{3}} \frac{1}{1+x^2} \sin^{-1}\left(\frac{2x}{1+x^2}\right) dx$

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118. Evaluate the following integrals: $\int_0^9 f(x)dx, where f(x) =$

$\{\sin x, 0 \leq x \leq \pi/2$

$1, \frac{\pi}{2} \leq x \leq 3$

$e^{x-3}, 3 \leq x \leq 9$

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119. Evaluate the following integrals: $\int_0^2 |x^2 - 3x + 2|dx$

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120. Evaluate the following integrals: $\int_0^1 \left(\frac{1-x}{1+x}\right) dx$

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121. Prove that: $\int_a^b \frac{f(x)}{f(x)+f(a+b-x)} dx = \frac{b-a}{2}$

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122. Evaluate of each of the following integrals (1-15):

$\int_0^5 \frac{\sqrt[3]{x+4}}{\sqrt[3]{x+4}+\sqrt[3]{9-x}} dx$

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123. Evaluate of each of the following integrals (1-15):

$$\int_{-\pi/4}^{\pi/4} \frac{x^{11} - 3x^9 + 5x^7 - x^5 + 1}{\cos^2 x} dx$$

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124. Evaluate of each of the following integrals (1-15):

$$\int_{-a}^{a} \frac{1}{1 + a^x} dx, a > 0$$

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125. Evalaute $\int_{\pi/6}^{\pi/3} \frac{\sqrt{(\sin x)} dx}{\sqrt{(\sin x)} + \sqrt{(\cos x)}}$

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126. Evaluate of each of the following integrals (1-15):

$$\int_0^{2\pi} \log(\sec x + \tan x) dx$$

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127. Evaluate: $\int_{-\pi/4}^{\pi/4} \frac{\sec^2 x}{e^{2x}-1} dx$

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128. Evaluate: $\int_{-\pi/4}^{\pi/4} \frac{\tan^2 x}{1+e^x} dx$

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129. Evaluate: $\int_{-\pi/2}^{\pi/2} \frac{x \sin x}{e^x+1} dx$

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130. If $f(a+b-x) = f(x)$, then prove that $\int_a^b x f(x) dx = \frac{a+b}{2} \int_a^b f(x) dx$.

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131. Evaluate of each of the following integrals (1-15):

$$\int_0^7 \left(\frac{x^{\frac{1}{3}}}{x^{\frac{1}{3}} + (7-x)^{\frac{1}{3}}} \right) dx$$

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132. Evaluate: $\int_1^2 x^2 dx$

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133. Evaluate: $\int_4^1 \frac{1}{x} dx$

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134. Evaluate: $\int_0^1 \frac{1}{\sqrt{1+x} + \sqrt{x}} dx$

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135. Evaluate: $\int_0^1 \frac{1}{2x-3} dx$

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136. Evaluate: $\int_0^{\pi/4} \tan^2 x dx$

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137. Evaluate $\int_0^{\frac{\pi}{2}} \sin^2 x dx$

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138. Evaluate: $\int_0^{\pi/4} \sin 3x \sin 2x \, dx$

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139. Evaluate: $\int_{1/4}^{1/2} \frac{1}{\sqrt{x - x^2}} dx$

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140. Evaluate: $\int_{2}^{4} \frac{x}{x^2 + 1} dx$

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141. Evaluate: $\int_{0}^{1} \frac{2x}{5x^2 + 1} dx$

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142. Evaluate: $\int_{0}^{2} \frac{5x + 1}{x^2 + 4} dx$

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143. Evaluate: $\int_{0}^{1} x\, e^x dx$

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144. Evaluate: $\int_1^2 \frac{\log x}{x^2} dx$

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145. Evaluate: $\int_0^{\pi/2} x \sin x \, dx$

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146. Evaluate: $\int_1^2 \frac{\log x}{x^2} dx$

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147. Evaluate: $\int_0^{\pi/2} x \sin x \, dx$

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148. Evaluate the definite integrals $\int_0^1 \left(xe^x + \frac{\sin(\pi x)}{4}\right) dx$

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149. $\int_1^2 \frac{5x^2}{x^2 + 4x + 3} dx$

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150. Evaluate: $\int_1^3 \frac{1}{x^2(x+1)} dx$

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151. Evaluate: $\int_1^3 \frac{1}{x^2(x+1)} dx$

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152. Evaluate : $\int_4^9 \frac{1}{\sqrt{x}} dx$

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153. Evaluate the following definite integral: $\int_2^3 \frac{1}{x+7} dx$

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154. Evaluate the following definite integral: $\int_0^{1/2} \frac{1}{\sqrt{1-x^2}} dx$

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155. Evaluate the following definite integral: $\int_0^1 \frac{1}{1+x^2} dx$

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156. Evaluate the following definite integral: $\int_2^3 \frac{x}{x^2+1} dx$

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157. Evaluate : $\int_0^\infty \frac{1}{a^2+b^2x^2} dx$

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158. Evaluate the following definite integral: $\int_{-1}^1 \frac{1}{1+x^2} dx$

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159. Evaluate the following definite integrals: $\int_0^\infty e^{-x} dx$

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160. Evaluate the following definite integral: $\int_0^1 \frac{x}{x+1} dx$

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161. Evaluate the following definite integral: $\int_0^{\pi/2} (\sin x + \cos x) dx$

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162. Evaluate the following definite integral: $\int_{\pi/4}^{\pi/2} \cot x \, dx$

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163. Evaluate the following definite integral: $\int_0^{\pi/4} sec\, x \, dx$

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164. Evaluate the following definite integral: $\int_{\pi/6}^{\pi/4} \operatorname{cosec} x \, dx$

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165. Evaluate : $\int_0^{\pi} \frac{1}{1+\sin x} dx$

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166. Evaluate the definite integrals $\int_0^{\frac{\pi}{2}} \cos^2 x dx$

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167. Evaluate the following definite integral: $\int_0^{\pi/6} \cos x \cos 2x \, dx$

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168. Evaluate : $\int_{\frac{\pi}{3}}^{\frac{\pi}{4}} (\tan x + \cot x)^2 dx$

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169. Evaluate the following definite integral $\int_0^{\frac{\pi}{2}} \cos^4 x dx$

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170. Evaluate the following definite integral:

$\int_0^{\pi/2} (a^2 \cos^2 x + b^2 \sin^2 x) dx$

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171. Evaluate the following definite integral: $\int_0^{\pi/2} \sqrt{1 + \cos x} \, dx$

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172. Evaluate the following definite integral: $\int_0^1 \frac{1-x}{1+x} dx$

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173. Evaluate the following definite integral: $\int_{-\pi/4}^{\pi/4} \frac{1}{1+s \in x} dx$

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174. Evaluate the following definite integral: $\int_0^{\pi/2} \cos^3 x \, dx$

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175. Evaluate the following definite integral $\int_0^{\frac{\pi}{2}} \cos^4 x dx$

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176. Evaluate the following definite integral: $\int_0^{\pi/2} x^2 \sin x \, dx$

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177. Evaluate the following definite integral: $\int_0^{\pi/2} \cos x \, dx$

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178. Evaluate the following definite integral: $\int_0^{\pi/2} x^2 \sin x \, dx$

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179. Evaluate the following definite integral: $\int_0^{\pi/2} \cos^2 x \, dx$

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180. Evaluate the following definite integral: $\int_1^3 (\log x) dx$

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181. Evaluate the following definite integral: $\int \frac{e^{\log \sqrt{x}}}{x} dx$

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182. Evaluate the following definite integral: $\int_1^2 \frac{x+3}{x(x+2)} dx$

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183. Evaluate the following definite integral: $\int_0^2 \frac{1}{4+x-x^2} dx$

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184. Evaluate the following definite integral: $\int_0^1 \sqrt{x} dx$

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185. Evaluate the following definite integral: $\int_0^4 \frac{1}{\sqrt{4x - x^2}} dx$

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186. Evaluate the following definite integral: $\int_1^4 \frac{x^2 + x}{\sqrt{2x + 1}} dx$

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187. Evaluate the following definite integral: $\int_1^2 \left(\frac{x - 1}{x^2} \right) e^x dx$

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188. Evaluate the following definite integral: $\int_0^1 \left(xe^x + \frac{\cos(\pi x)}{4} \right) dx$

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189. Evaluate the following definite integral: $\int_0^{2\pi} e^{x/2} \sin\left(\frac{x}{2} + \frac{\pi}{4}\right) dx$

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190. Evaluate the definite integrals $\int_0^1 \frac{dx}{\sqrt{1+x} - \sqrt{x}}$

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191. Evaluate the following definite integral: $\int_1^2 e^{2x}\left(\frac{1}{x} - \frac{1}{2x^2}\right) dx$

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192. Evaluate the following definite integral: $\int_0^{\pi/2} x^2 \sin x \, dx$

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193. Evaluate the following definite integral: $\int_0^{\pi/2} \cos^2 x \, dx$

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194. Evaluate the following definite integral: $\int_1^2 \log x \, dx$

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195. Evaluate the following definite integral: $\int_1^e \frac{e^x}{x}(1 + x \log x)dx$

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196. Evaluate : $\int_e^{e^2} \left\{ \frac{1}{\log x} - \frac{1}{(\log x)^2} \right\} dx$

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197. Evaluate the definite integrals $\int_0^1 \frac{2x+3}{5x^2+1}dx$

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198. Evaluate the following definite integral: $\int_0^1 \frac{1}{2x^2+x+1}dx$

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199. Evaluate the following definite integral: $\int_0^2 \frac{1}{\sqrt{3+2x-x^2}}dx$

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200. Evaluate the following definite integral: $\int_{-1}^1 \frac{1}{x^2+2x+5}dx$

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201. Evaluate : $\int_0^1 x(1-x)^5 dx$

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202. Evaluate the following definite integral: $\int_0^1 \left(xe^{2x} + \frac{\sin(\pi x)}{2}\right) dx$

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203. Evaluate the following definite integral: $\int_{\pi/2}^{\pi} e^x \left(\frac{1-\sin x}{1-\cos x}\right) dx$

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204. Evaluate : $\int_0^{2\pi} e^x \cos\left(\frac{\pi}{4} + \frac{x}{2}\right) dx$

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205. Evaluate the following definite integral: $\int_1^2 \frac{x}{(x+1)(x+2)} dx$

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206. Evaluate the following definite integral: $\int_0^{\pi} \left(\frac{\sin^2 x}{2} - \frac{\cos^2 x}{2} \right) dx$

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207. If $\int_0^k \frac{1}{2+8x^2} dx = \frac{\pi}{16}$, find the value of k.

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208. If $\int_0^a 3x^2 dx = 8$, find the value of a.

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209. Evaluate the following integral : $\int_{\pi}^{3\pi/2} \sqrt{1-\cos 2x}\, dx$

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210. Evaluate the following integral : $\int_{0}^{2\pi} \sqrt{1+\sin\left(\frac{x}{2}\right)}dx$

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211. Evaluate : $\int_{0}^{\frac{\pi}{4}} (\tan x + \cot x)^{-2} dx$

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212. Evaluate the following integral : $\int_{\pi/6}^{\pi/3} (tanx + \cot x)^2 dx$

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213. Evaluate : $\int_0^1 \frac{1}{1+2x+2x^2+2x^3+x^4}dx$

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214. Evaluate : $\int_0^1 x\log(1+2x)dx$

Watch Video Solution

215. Evaluate: $\int_0^{\pi/2} \frac{1}{\left(a^2\cos^2 x+b^2\sin^2 x\right)^2}dx$

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216. Evaluate: $\int_0^1 \sin^{-1} x\, dx$

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217. Evaluate: $\int_0^{\pi/2} \sqrt{\cos\theta}\sin^3\theta d\theta$

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218. Evaluate: $\int_0^{\pi/2} \frac{1}{\cos^3 x\sqrt{2\sin 2x}}dx$

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219. Evaluate: $\int_0^{\pi/2} \frac{\cos\theta}{(1+\sin\theta)(2+\sin\theta)}dth\eta$

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220. Evaluate the following integral: $\int_0^{1/2} \frac{1}{(1+x^2)\sqrt{1-x^2}}dx$

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221. Evaluate: $\int_0^a \frac{x^4}{\sqrt{a^2 - x^2}} dx$

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222. Evaluate: $\int_0^1 \frac{x tan^{-1} x}{(1 + x^2)^{3/2}} dx$

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223. Evaluate: $\int \frac{\sin^{-1} x}{(1 - x^2)^{\frac{3}{2}}} dx$

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

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225. Evaluate: $\int_0^{\pi/4} \tan^3 x \, dx$

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226. Evaluate the following integral: $\int_0^{\pi/2} \frac{1}{2\cos x + 4\sin x} dx$

Watch Video Solution

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

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228. Evaluate: $\int_0^{\pi/2} \frac{1}{4\sin^2 x + 5\cos^2 x} dx$

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229. Evaluate: $\int_0^{\pi/2} \frac{x \sin x \cos x}{\sin^4 x + \cos^4 x} dx$

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230. Evaluate: $\int_0^{\pi/2} \frac{\sin 2x}{\cos^4 x + \sin^4 x} dx$

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231. Evaluate: $\int_0^{\pi/2} \frac{\cos^2 x}{\cos^2 x + 4\sin^2 x} dx$

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232. Evaluate the following integral: $\int_2^4 \frac{x}{x^2+1} dx$

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233. Evaluate the following integral: $\int_1^2 \frac{1}{x(1+\log x)^2} dx$

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234. Evaluate the following integral: $\int_1^2 \frac{3x}{9x^2-1} dx$

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235. Evaluate the following integral: $\int_0^a \frac{x}{\sqrt{a^2+x^2}} dx$

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236. Evaluate the following integral: $\int_0^1 xe^x \hat{} \, 2dx$

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237. Evaluate the following integral: $\int_0^1 \frac{2x}{1+x^4}dx$

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238. Evaluate the following integral: $\int_1^2 \frac{1}{x(1+\log x)^2}dx$

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239. Evaluate the following integral: $\int_0^{\pi/2} \frac{1}{5\cos x + 3\sin x}dx$

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240. Evaluate the following integral: $\int_0^1 \frac{e^x}{1+e^{2x}}dx$

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241. Evaluate the following integral: $\int_1^3 \frac{\cos(\log x)}{x} dx$

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242. Evaluate the following integral: $\int_0^a \sqrt{a^2 - x^2} dx$

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243. Evaluate the following integral: $\int_0^{\pi/2} \sqrt{\sin\varphi} \cos^5\varphi d\varphi$

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244. Evaluate the following integral: $\int_0^{\pi/2} \frac{\sin\theta}{\sqrt{1+\cos\theta}} d\theta$

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245. Evaluate the following integral: $\int_0^1 \frac{\sqrt{\tan^{-1} x}}{1+x^2} dx$

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246. Evaluate the following integral: $\int_0^1 \tan^{-1}\left(\frac{2x}{1-x^2}\right) dx$

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247. Evaluate the following integral: $\int_0^{\pi/2} \frac{dx}{a\cos x + b\sin x} x$

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248. Evaluate the following integral: $\int_0^{\pi} \frac{\sin x}{\sin x + \cos x} dx$

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249. Evaluate the following integral: $\int_0^1 \tan^{-1} x \, dx$

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250. Evaluate the following integral: $\int_0^{\pi/4} \left(\sqrt{tanx} + \sqrt{\cot x}\right) dx$

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251. Evaluate the following integral: $\int_0^{\pi} \frac{1}{5 + 3\cos x} dx$

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252. Evaluate the following integral: $\int_0^{\pi/2} \frac{x + \sin x}{1 + \cos x} dx$

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253. Evaluate the following integral: $\int_0^{\pi/4} \frac{\sin x + \cos x}{3 + \sin 2x} dx$

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254. Evaluate the following integral: $\int_0^1 \frac{1 + x^2}{x^4 + x^2 + 1} dx$

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255. Evaluate the following integral: $\int_4^{12} x(x-4)^{1/3} dx$

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256. Evaluate the following integral: $\int_{-1}^{1} 5x^4 \sqrt{x^5 + 1} dx$

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257. Evaluate the following integral: $\int_0^{\pi/4} \sin^3 2t \cos 2t \, dt$

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258. Evaluate the following integral: $\int_0^{\pi/2} \frac{\cos x}{1+\sin^2 x} dx$

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259. Evaluate the following integral: $\int_0^{\pi/3} \frac{\cos x}{3+4\sin x} dx$

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260. Evaluate the following integral: $\int_0^2 x\sqrt{x+2}\, dx$

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261. Evaluate the following integral: $\int_0^{\pi/2} \frac{\sin x \cos x}{1+\sin^4 x} dx$

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262. Evaluate the following integral: $\int_0^{\pi} \frac{1}{5+4\sin x} dx$

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263. Evaluate the following integral: $\int_0^{\pi} \frac{1}{3+2\sin x+\cos x} dx$

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264. Evaluate the following integral: $\int_0^{1/2} \frac{x \sin^{-1} x}{\sqrt{1-x^2}} dx$

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265. Evaluate the following integral: $\int_0^{\pi/4} \frac{\tan^3 x}{1+\cos 2x} dx$

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266. Evaluate the following integral: $\int_0^{\pi} \frac{x}{a^2 \cos^2 x + b^2 \sin^2 x} dx$

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267. Evaluate the following integral: $\int_0^1 \frac{\tan^{-1} x}{1+x^2} dx$

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268. Evaluate the following integral: $\int_0^1 x tan^{-1} x \, dx$

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269. Evaluate the following integral: $\int_0^{\pi/2} x^2 \sin x \, dx$

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270. Evaluate the following integral: $\int_0^1 \frac{1-x^2}{(1+x^2)^2} dx$

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271. Evaluate the following integral: $\int_0^{\pi/2} \frac{\cos^2 x}{1+3\sin^2 x} dx$

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272. Evaluate the following integral: $\int_0^{\pi} 5(5-4\cos\theta)^{1/4} \sin\theta d\theta$

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273. Evaluate the following integral: $\int_4^9 \frac{\sqrt{x}}{\left(30 - x^{\frac{3}{2}}\right)^2} dx$

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274. Evaluate the following integral: $\int_0^{\pi} \sin^3 x(1 + 2\cos)(1 + \cos x)^2 dx$

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275. Evaluate the following integral: $\int_0^{\pi/2} 2s \in x \cos x \tan^{-1}(\sin x) dx$

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276. Evaluate the following integral: $\int_0^{\pi/2} s \in 2x \tan^{-1}(\sin x) dx$

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277. $\int_0^a x\sqrt{\frac{a^2-x^2}{a^2+x^2}}dx$

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278. Evaluate the following integral: $\int_0^{\pi/2} \frac{\sin x \cos x}{\cos^2 x + 3\cos x + 2}dx$

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279. Evaluate the following integral: $\int_0^{1/2} \frac{1}{(1+x^2)\sqrt{1-x^2}}dx$

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280. Evaluate the following integral: $\int_0^1 \left(\cos^{-1} x\right)^2 dx$

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281. Evaluate the following integral: $\int_{\pi/3}^{\pi/2} \frac{\sqrt{1+\cos x}}{(1-\cos x)^{3/2}} dx$

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282. Evaluate the following integral: $\int_{-a}^{a} \sqrt{\frac{a+x}{a-x}} dx$

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283. Evaluate the following integral: $\int_{1/3}^{1} \frac{\left(x-x^3\right)^{1/3}}{x^4} dx$

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284. Evaluate the following integral:

$\int_0^{\pi/2} \sqrt{\cos x - \cos^3 x} \left(\sec^2 x - 1\right) \cos^2 x \, dx$

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285. Evaluate the following integral:

$$\int_0^9 f(x)dx, \text{ where } f(x)\left\{\sin x,\ 0 \le x \le \pi/21, \frac{\pi}{2} \le x \le 3e^{x-3},\ 3 \le x \le\right.$$

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286. Evaluate the following integral:

$$\int_2^4 f(x)dx, \text{ where } f(x) = \{7x+3, \quad \text{if} \quad 1 \le x \le 38x, \quad \text{if} \quad 3 \le x \le 4$$

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287. Evaluate the following integral: $\int_{-4}^{4} |x+2|dx$

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288. Evaluate the following integral: $\int_{-1}^{1} |x+1|dx$

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289. Evaluate the following integral: $\int_{-6}^{6} |x+2| dx$

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290. Evaluate the following integral: $\int_{1}^{2} |x-3| dx$

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291. Evaluate the following integral: $\int_{1}^{2\pi} |s \in x| dx$

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292. Evaluate the following integral: $\int_{2}^{8} |x-5| dx$

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293. Evaluate the following integral: $\int_0^4 |x-1|dx$

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294. Evaluate the following integral: $\int_0^4 (|x|+|x-2|+|x-4|)dx$

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295. Evaluate the following integral: $\int_{-2}^{2} xe^{|x|}dx$

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296. Evaluate the following integral: $\int_{-\pi/2}^{\pi} \sin^{-1}(\sin x)dx$

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297. Evaluate the following integral: $\int_{-3}^{3} |x+1| dx$

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298. Evaluate the following integral: $\int_{-1}^{2} |2x+3| dx$

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299. Evaluate the following integral: $\int_{0}^{3} |3x-1| dx$

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300. Evaluate the following integral: $\int_{-2}^{2} |x+1| dx$

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301. Evaluate the following integral: $\int_{-\pi/4}^{\pi/4} |s \in x| dx$

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302. Evaluate the following integral: $\int_{-\pi/2}^{\pi/2} |\sin x + \cos x| dx$

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303. Evaluate the following integral: $\int_{1}^{4} \{|x-1| + |x-2| + |x-4|\} dx$

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304. Evaluate the following integral: $\int_{-\pi/2}^{\pi/2} (2\sin|x| + \cos x) dx$

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305. Evaluate of each of the following integral: $\int_0^{2\pi} \frac{dx}{e^{\sin x}+1} dx$

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306. Evaluate of each of the following integral: $\int_{-\pi/4}^{\pi/4} \frac{\tan^2 x}{1+e^x} dx$

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307. Evaluate of each of the following integral: $\int_{-\pi/3}^{\pi/3} \frac{1}{1+e^x} dx$

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308. Evaluate of each of the following integral: $\int_0^{\pi/2} (2\log\cos x - \log s \in 2x) dx$

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309. Evaluate of each of the following integral: $\int_{\pi/6}^{\pi/3} \frac{1}{1+\sqrt{\tan x}} dx$

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310. Evaluate of each of the following integral: $\int_{-\pi/2}^{\pi/2} \frac{\cos^2 x}{1+e^x} dx$

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311. Evaluate of each of the following integral: $\int_a^b \frac{x^{1/n}}{x^{1/n}+(a+b-x)^{\frac{1}{n}}} dx,\ nN,\ n \geq 2$

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312. Evaluate of each of the following integral: $\int_0^a \frac{\sqrt{x}}{\sqrt{x}+\sqrt{a-x}} dx$

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313. If $f(a+b-x)=f(x)$, then prove that $\int_a^b x f(x)dx = \frac{a+b}{2}\int_a^b f(x)dx$

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314. Evaluate: $\int_0^{\pi/2} \frac{\sqrt{s \in x}}{\sqrt{s \in x}+\sqrt{\cos x}}dx$

Watch Video Solution

315. Evaluate: $\int_0^{\pi/2} \log \tan x \, dx$

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316. Evaluate: $\int_0^{\pi/4} \log(1+\tan x)dx$

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317. Evaluate: $\int_0^{\pi/2} \frac{s \in x - \cos x}{1 + s \in x \cos x} dx$

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318. Evaluate: $\int_0^{\pi/2} (2 \log \sin x - \log \sin 2x) dx$

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319. Evaluate: $\int_0^{\pi} \frac{e^{\cos x}}{e^{\cos x} + e^{-\cos x}} dx$

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320. Evaluate: $\int_0^1 x(1-x)^n dx$

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321. Evaluate: $\int_0^1 \cot^{-1}(1-x+x^2)\,dx$

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322. If f and g are continuious on $[0,\ a]$ and satisfy $f(x)=f(a-x)$ and $g(x)+g(a-x)=2$. show that $\int_0^a f(x)g(x)dx=\int_0^a f(x)dx$

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323. Evaluate: $\int_0^{2\pi}\frac{1}{1+e^{\sin x}}dx$

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324. Evaluate: $\int_0^{\pi}\frac{1}{1+e^{\cos x}}dx$

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325. Evaluate: $\int_0^{\pi} \frac{x}{a^2 \cos^2 x + b^2 \sin^2 x} dx$

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

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327. Evaluate: $\int_0^{\pi} \frac{x}{1 + \sin x} dx$

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328. Evaluate: $\int_0^{\pi} \frac{x \tan x}{sec x + \tan x} dx$

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329. Evaluate: $\int_0^{\pi/2} \frac{x}{\sin x + \cos x} dx$

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330. Evaluate: $\int_0^{\pi/2} \frac{x \sin x \cos x}{\sin^4 x + \cos^4 x} dx$

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331. Evaluate: $\int_{-\pi/2}^{\pi/2} \frac{1}{1 + e^{s \in x}} dx$

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332. Evaluate: $\int_{-\pi/2}^{\pi/2} \frac{1}{1 + e^{\sin x}} dx$

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333. Evaluate: $\int_{-\pi/2}^{\pi/2} \frac{\cos x}{1 + e^{x}} dx$

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334. Evaluate: $\int_{-\pi/2}^{\pi/2} \sin^7 x dx$

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335. Evaluate: $\int_{-\pi/2}^{\pi/2} \sin^2 x \, dx$

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336. Evaluate: $\int_{-\pi/2}^{\pi/2} |\sin x| dx$

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337. Evaluate: $\int_{-\pi}^{\pi} (\cos ax + \sin bx)^2 dx$

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338. Evaluate: $\int_{-1}^{3/2} |x \sin \pi x| dx$

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339. Evaluate: $\int_0^{2\pi} \cos^5 x \, dx$

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340. Prove that: $\int_0^{\pi/2} \log \sin x \, dx = \int_0^{\pi/2} \log \cos x \, dx = -\frac{\pi}{2} \log 2$

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341. Evaluate: $\int_0^{\pi} \log(1 + \cos x) dx$

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342. Evaluate the following integral: $\int_0^{\pi/2} \frac{1}{1 + \tan x}$

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343. Evaluate the following integral: $\int_0^{\pi/2} \frac{\sqrt{\cot x}}{\sqrt{\cot x}+\sqrt{\tan x}}dx$

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344. Evaluate the following integral: $\int_0^a \frac{1}{x+\sqrt{a^2-x^2}}dx$

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345. Evaluate the following integral: $\int_0^{\pi/2} \frac{1}{1+\cot x}dx$

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346. Evaluate the following integral: $\int_0^{\pi/2} \frac{\sin^{3/2}}{\sin^{3/2}x+\cos^{3/2}x}dx$

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347. Evaluate the following integral: $\int_0^{\pi/2} \frac{1}{1+\tan x} dx$

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348. Evaluate the following integral: $\int_0^{\infty} \frac{\log x}{1+x^2} dx$

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349. Evaluate the following integral: $\int_0^1 \frac{\log(1+x)}{1+x^2} dx$

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350. Evaluate the following integral: $\int_0^{\pi} \frac{x \tan x}{\sec x \cos ec\, x} dx$

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351. Evaluate the following integral: $\int_0^{\pi} x \sin^3 x \, dx$

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352. Evaluate the following integral: $\int_0^{\pi} \frac{x \sin x}{1 + \sin x} dx$

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353. Evaluate the following integral: $\int_0^{\pi/2} \frac{\tan^7 x}{\tan^7 x + \cot^7 x} dx$

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354. Evaluate the following integral: $\int_0^{\pi/2} x \; s \in x \cos^2 x \, dx$

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355. Evaluate the following integral: $\int_{-\pi/2}^{\pi/2} \sin^3 x \, dx$

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356. Evaluate the following integral: $\int_{-1}^{1} \log\left(\frac{2-x}{2+x}\right) dx$

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357. Evaluate the following integral: $\int_{0}^{\pi} \log(1-\cos x) dx$

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358. Evaluate the following integral: $\int_{-\pi}^{\pi} \frac{2x(1+\sin x)}{1+\cos^2 dx} dx$

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359. Evaluate the following integral: $\int_0^2 x\sqrt{2-x}\,dx$

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360. Evaluate the following integral: $\int_0^\infty \frac{x}{(1+x)(1+x^2)}dx$

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361. Evaluate the following integral: $\int_0^\pi x\sin x\cos^4 x\,dx$

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362. Evaluate the following integral: $\int_0^\pi x\log\sin x\,dx$

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363. Evaluate the following integral: $\int_0^\pi x\log\sin x\,dx$

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364. Evaluate the following integral: $\int_{\frac{\pi}{6}}^{\frac{\pi}{3}} \left(\frac{1}{1+\cot^{\frac{3}{2}} x} \right) dx$,

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365. Evaluate the following integral: $\int_{\pi/6}^{\pi/3} \frac{1}{1+\cot^{3/2} x} dx$

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366. Evaluate the following integral: $\int_{2}^{8} \frac{\sqrt{10-x}}{\sqrt{x}+\sqrt{10-x}} dx$

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367. Evaluate the following integral: $\int_{0}^{\pi/2} \frac{x \sin x \cos x}{\sin^4 x + \cos^4 x} dx$

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368. Evaluate the following integral: $\int_{-\pi/2}^{\pi/2} \sin^4 x \, dx$

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369. Evaluate the following integral: $\int_{-\pi/4}^{\pi/4} \sin^2 x \, dx$

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370. Evaluate the following integral: $\int_{-\pi/2}^{\pi/2} \log\left(\frac{2-\sin x}{2+\sin x}\right) dx$

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371. Evaluate the following integral:

$\int_{-3\pi/2}^{-\pi/2} \left\{\sin^2(3\pi+x) + (\pi+x)^3\right\} dx$

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372. Evaluate the following integral: $\int_0^1 \log\left(\frac{1}{x}-1\right)dx$

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373. Evaluate the following integral: $\int_0^{2\pi} \sin^{100} x \cos^{101} x \, dx$

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374. If f is an integrable function such that $f(2a-x)=f(x)$, then prove that $\int_0^{2a} f(x)dx = 2\int_0^a f(x)dx$

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375. If $f(2a-x) = -f(x)$, prove that $\int_0^{2a} f(x)dx = 0$

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376. If f is an integrable function, show that $\int_{-a}^{a} f(x^2)\,dx = 2\int_{0}^{a} f(x^2)\,dx$

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377. If f is an integrable function, show that $\int_{-a}^{a} x f(x^2)\,dx = 0$

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378. If $f(x)$ is a continuous function defined on $[0,\ 2a]$. Then prove that $\int_{0}^{2a} f(x)dx = \int_{0}^{a} \{f(x) + (2a - x)\}dx$

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379. If $f(a + b - x) = f(x)$, then prove that $\int_{a}^{b} x f(x)dx \frac{a+b}{2} \int_{a}^{b} f(x)dx$.

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380. If $f(a+b-x0=f(x)$, then prove that $\int_a^b xf(x)dx=\left(\frac{a+b}{2}\right)\int_a^b f(x)dx\cdot$

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381. Property 8: If f(x) is a continuous function defined on $[-a;a]$ then $\int_{-a}^{a} f(x)dx=\int_0^a \{f(x)+f(-x)\}dx$

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382. If $\int_0^{\pi} xf(\sin x)dx=A\int_0^{\frac{\pi}{2}} f(\sin x)dx$, then A is (A) $\frac{\pi}{2}$ (B) π (C) 0 (D) 2π

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383. Evaluate the following integrals as limit of sum: $\int_0^2 (x+4)dx$

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384. Evaluate the following integrals as limit of sum: $\int_0^2 (2x+1)dx$

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385. Evaluate the following integrals as limit of sum: $\int_0^3 (x+4)dx$

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386. Evaluate the following integrals as limit of sum: $\int_1^3 (3x-2)dx$

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387. Evaluate the following integrals as limit of sum: $\int_1^3 (3x-2)dx$

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388. Evaluate the following definite integrals as limit of sums. $\int_0^5 (x+1)dx$

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389. Evaluate the following integrals as limit of sum: $\int_3^5 (2-x)dx$

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390. Evaluate the definite integrals as limit of sums $\int_1^2 x^2 dx$

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391. Evaluate the following integrals as limit of sum: $\int_1^2 (x^2-1)dx$

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392. Evaluate the following integrals as limit of sum: $\int_0^2 (x+3)dx$

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393. Evaluate the following integrals as limit of sum: $\int_{-1}^1 (x+3)dx$

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394. Evaluate the following integrals as limit of sum: $\int_1^3 (2x+3)dx$

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395. Evaluate the following integrals as limit of sum: $\int_1^3 (2x+3)dx$

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396. Evaluate the following integrals as limit of sum: $\int_0^2 (x^2+1)dx$

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397. Evaluate the following integrals as limit of sum: $\int_2^3 (2x^2+1)\,dx$

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398. Evaluate the following integrals as limit of sum: $\int_0^2 (x^2+4)\,dx$

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399. Evaluate the following integrals as limit of sum: $\int_1^4 (x^2-x)\,dx$

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400. Evaluate the following integrals as limit of sum: $\int_0^2 e^x\,dx$

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401. Evaluate the following integrals using limit of sum.

$$\int_a^b \cos x dx$$

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402. Evaluate the following integrals as limit of sum: $\int_0^{\pi/2} \cos x \, dx$

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403. Evaluate the following integrals as limit of sum: $\int_0^2 (3x^2 - 2) dx$

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404. Evaluate the following definite integrals as limit of sums.

$$\int_0^4 (x + e^{2x}) dx$$

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405. Evaluate $\int_0^2 (x^2 + 2x + 1)dx$ as limit of a sum.

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406. Evaluate the following definite integrals as limit of sums. $\int_a^b x dx$

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407. Evaluate the following integrals as limit of sum: $\int_2^3 x^2 dx$

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408. Evaluate the following definite integrals as limit of sums. $\int_2^3 x^2 dx$

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409. Evaluate the following integrals as limit of sum: $\int_0^2 (x^2 - x)\,dx$

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410. Evaluate the following integrals as limit of sum: $\int_1^3 (3x^2 + 1)\,dx$

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411. Evaluate the following integrals as limit of sum: $\int_0^1 (3x^2 + 5x)\,dx$

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412. Evaluate the following integrals as limit of sum: $\int_0^2 e^x\,dx$

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413. Evaluate the following integrals as limit of sum: $\int_0^{\pi/2} \sin x \, dx$

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414. Evaluate the following definite integrals as limit of sum: $\int_0^2 (x^2 + 2) dx$

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415. Evaluate the following integrals as limit of sum: $\int_1^4 (3x^2 + 2x) dx$

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416. Evaluate the following integral: $\int_0^2 (x^2 + x) dx$

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417. Evaluate the following integrals as limit of sum:

$$\int_0^{3.} (2x^2 + 3x + 5)\,dx$$

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418. Evaluate the following definite integrals as limit of sums.

$$\int 05(x + 1)\,dx$$

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419. Evaluate the following definite integrals as limit of sums.

$$\int 14(x^2 - x)\,dx$$

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420. Evaluate: $\int_1^3 (2x^2 + 5x)\,dx$ as limit of a sum.

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421. Evaluate each of the following integral: $\int_0^{\pi/2} \sin^2 x \, dx$

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422. Examples: $\int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} \sin^2 x dx$

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423. Evaluate each of the following integral: $\int_{-\pi/2}^{\pi/2} \sin^3 x \, dx$

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424. Evaluate each of the following integral: $\int_0^{\pi/4} \tan^2 x \, dx$

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425. Evaluate each of the following integral: $\int_{-2}^{1} \frac{|x|}{x} dx$

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426. Evaluate each of the following integral: $\int_{0}^{4} \frac{1}{\sqrt{16 - x^2}} dx$

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427. Evaluate: $\int_{0}^{\pi/2} \sqrt{1 - \cos 2x} dx$.

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428. Evaluate each of the following integral: $\int_{0}^{\pi/2} \log\left(\frac{3 + 5\cos x}{3 + 5\sin x}\right) dx$

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429. Evaluate each of the following integral: $\int_0^{\pi} \cos^5 x \, dx$

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430. Evaluate each of the following integral: $\int_{-1}^{1} x|x|dx$

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431. Evaluate the following definite integral: $\int_0^1 \frac{1}{1+x^2}dx$

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432. Evaluate each of the following integral: $\int_2^3 \frac{1}{x}dx$

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433. Evaluate each of the following integral: $\int_0^1 \frac{2x}{1+x^2 dx}$

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434. Evaluate each of the following integral: $\int_0^{\pi/4} \sin 2x \, dx$

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435. Evaluate each of the following integral: $\int_0^{\pi/2} \cos^2 x \, dx$

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436. Evaluate each of the following integral: $\int_{-\pi/2}^{\pi/2} \cos^2 x \, dx$

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437. Evaluate each of the following integral: $\int_{-\pi/2}^{\pi/2} x \cos^2 x \, dx$

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438. Evaluate the following definite integral: $\int_0^{\frac{1}{2}} \frac{1}{\sqrt{1+x^2}} dx$

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439. Evaluate each of the following integral: $\int_0^{\infty} e^{-x} dx$

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440. Evaluate each of the following integral: $\int_0^3 \frac{1}{x^2+9} dx$

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441. Evaluate each of the following integral: $\int_0^{\pi/2} \log \tan x \, dx$

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442. Evaluate the following integrals: (1-35) $\int_0^{\pi/2} \frac{\sin^n x}{\sin^n + \cos^n x} dx$

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443. Evaluate each of the following integral: $\int_{-\pi/2}^{\pi/2} \log\left(\frac{a - \sin\theta}{a + \sin\theta}\right) d\theta$

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444. Evaluate each of the following integral: $\int_a^b \frac{f(x)}{f(x) + f(a + b - x)} dx$

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445. Evaluate each of the following integral: $\int_0^2 \sqrt{4-x^2}dx$

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446. Evaluate each of the following integral: $\int_0^1 x\, e^{x\ \hat{}\ 2}dx$

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447. Evaluate each of the following integral: $\int_e^{e^2} \frac{1}{x\log x}dx$

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448. Evaluate each of the following integral: $\int_e^{\pi/2} e^x(\sin x - \cos x)dx$

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449. Evaluate each of the following integral: $\int_2^4 \frac{x}{x^2+1} dx$

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450. If $\int_0^1 (3x^2 + 2x + k) dx = 0$, find the value of k.

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451. If $\int_0^a 3x^2 dx = 8$, write the value of $'a'$.

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452. If $(x) = \int_0^x t \sin t \, dt$, then write the value of $f'(x)$

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453. If $\int_0^a \frac{1}{4+x^2}dx = \frac{\pi}{8}$, find the value of a.

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454. The value of $\int_{-2}^{2}(ax^3+bx+c)dx$ depends on (A) the value of b (B) the value of c (C) the value of a (D) the value of a and b

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455. If $[.]and\ \{.\}$ denote respectively the greatest integer and fractional part functional respectively, evaluate the following integral: $\int_0^2 [x]dx$

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456. If $[.]and\ \{.\}$ denote respectively the greatest integer and fractional part functional respectively, evaluate the following integral: $\int_0^1 \{x\}dx$

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457. If $[.]and\ \{.\}$ denote respectively the greatest integer and fractional part functional respectively, evaluate the following integral: $\int_0^2 x[x]dx$

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458. If $[.]and\ \{.\}$ denote respectively the greatest integer and fractional part functional respectively, evaluate the following integral: $\int_1^2 (\log)_e\ [x]dx$

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459. If $[.]and\ \{.\}$ denote respectively the greatest integer and fractional part functional respectively, evaluate the following integral: $\int_0^{15} [x]dx$

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460. If $[.]and\ \{.\}$ denote respectively the greatest integer and fractional part functional respectively, evaluate the following integral: $\int_0^1 e^{[x]}dx$

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461. If $[.]and\ \{.\}$ denote respectively the greatest integer and fractional part functional respectively, evaluate the following integral: $\int_0^1 2^{x-[x]}dx$

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462. If $[.]and\ \{.\}$ denote respectively the greatest integer and fractional part functional respectively, evaluate the following integral: $\int_0^{\sqrt{2}} [x^2]dx$

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463. The value of $\int_0^{\pi/2} \frac{\sqrt{\cos x}}{\sqrt{\cos x}+\sqrt{s\in x}}dx$ is $\pi/2$ b. $\pi/4$ c. 0 d. none of these

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464. $\int_0^{\frac{\pi}{2}} \frac{1}{1+\sin x} dx$ equals 0 b. $1/2$ c. 2 d. $3/2$

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465. $\int_0^{\infty} \frac{1}{1+e^x} dx$ equals a. $\log 2 - 1$ b. $\log 2$ c. $\log 4 - 1$ d. $\log 2$

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466. The value of $\int_0^{2\pi} \sqrt{1+\sin\left(\frac{x}{2}\right)} dx$ is 0 b. 4 c. 2 d. 8

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467. $\int_0^{\pi^2/4} \frac{\sin\sqrt{x}}{\sqrt{x}} dx$ equals

a. $\pi^2/8$

b. $\pi/4$

c. 2

d. 1

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468. $\int_0^{\pi/2} \frac{1}{2+\cos x} dx$ equals $\frac{1}{3}\tan^{-1}\left(\frac{1}{\sqrt{3}}\right)$ b. $\frac{2}{\sqrt{3}}\tan^{-1}\left(\frac{1}{\sqrt{3}}\right)$ c. $\sqrt{3}\tan^{-1}(\sqrt{3})$ d. $2\sqrt{3}\tan^{-1}\sqrt{3}$

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469. $\frac{36}{\pi}\int_{\pi/6}^{\pi/3} \frac{dx}{1+\sqrt{\cot x}}$ equals to

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470. Given that $\int_0^{\infty} \frac{x^2}{(x^2+a^2)(x^2+b^2)(x^2+c^2)} dx = \frac{\pi}{2(a+b)(b+c)(c+a)}$ the

value of $\int_0^\infty \frac{dx}{(x^2+4)(x^2+9)}$, is $\frac{\pi}{60}$ b. $\frac{\pi}{40}$ c. $\frac{\pi}{20}$ d. $\frac{\pi}{80}$

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471. $\int_1^e \log x\, dx = $ 1 b. $e-1$ c. $e+1$ d. 0

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472. $\int_1^{\sqrt{3}} \frac{1}{1+x^2} dx$ is equal to $\frac{\pi}{12}$ b. $\frac{\pi}{4}$ c. $\frac{\pi}{6}$ d. $\frac{\pi}{3}$

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473. The value of $\int_0^{\pi/2} \cos x\, e^{\sin x} dx$ *is* 1 b. $e-1$ c. 0 d. -1

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474. If $\int_0^a \frac{1}{1+4x^2} dx = \frac{\pi}{8}$, then a equals $\frac{\pi}{2}$ b. $\frac{\pi}{4}$ c. $\frac{1}{2}$ d. 1

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475.

$\int_0^1 f(x)dx = 1,\ \int_0^1 xf(x)dx = a,\ \int_0^1 x^2 f(x)dx = a^2,\ then \int_0^1 (a-x)^2$

equals a. $4a^2$ b. 0 c. $2a^2$ d. none of these

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476. The value of $\int_{-\pi}^{\pi} \sin^3 x \cos^2 x\, dx$ is $\frac{\pi^4}{2}$ b. $\frac{\pi^4}{4}$ c. 0 d. none of these

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477. $\int_{\pi/6}^{\pi/3} \frac{1}{\sin 2x} dx$ is equal to $(\log)_e 3$ b. $(\log)_e \sqrt{3}$ c. $\frac{1}{2}\log(-1)$ d. $\log(-1)$

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478. $\int_{-1}^{1}|1-x|dx$ is equal to -2 b. 2 c. 0 d. 4

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479. $(\lim)_{n\to\infty}\left\{\frac{1}{2n+1}+\frac{1}{2n+2}++\frac{1}{2n+n}\right\}$ $In\left(\frac{1}{3}\right)$ b. $In\left(\frac{2}{3}\right)$ c. $In\left(\frac{3}{2}\right)$ d. $In\left(\frac{4}{3}\right)$

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480. The value of the integral $\int_{-2}^{2}\left|1-x^2\right|dx$ is 4 b. 2 c. -2 d. 0

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481. $\int_{0}^{\pi/2}\frac{1}{1+\cot^3 x}dx$ is equal to 0 b. 1 c. $\pi/2$ d. $\pi/4$

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482. $\int_0^{\pi/2} \frac{\sin x}{\sin x + \cos x} dx$ equals to $\pi/2$ b. $\pi/4$ c. $\pi/3$ d. π

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483. $\int_0^{\pi/2} x \sin x \, dx$ is equal to $\pi/2$ b. $\pi/4$ c. π d. 1

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484. $\int_0^{\pi/2} \sin 2x \log \tan x \, dx$ is equal to $\pi/2$ b. π c. 0 d. 2π

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485. The value of $\int_0^{\pi} \frac{1}{5 + 3\cos x} dx$ is $\pi/2$ b. $\pi/4$ c. 0 d. $\pi/8$

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486. $\int_0^{\infty} \log\left(x + \frac{1}{x}\right) \frac{dx}{1 + x^2}$

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487. $\int_0^{2a} f(x)dx$ is equal to $2\int_0^a f(x)dx$ b. 0 c. $\int_0^a f(x)dx + \int_0^a f(2a-x)dx$ d. $\int_0^a f(x)dx + \int_0^{2a} f(2a-x)dx$

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488. If $f(a+b-x) = f(x),\ then \int_a^b xf(x)dx$ is equal to $\frac{a+b}{2}\int_a^b f(b-x)dx$ b. $\frac{a+b}{2}\int_a^b f(b+x)dx$ c. $\frac{b-1}{2}\int_a^b f(x)dx$ d. $\frac{a+b}{2}\int_a^b f(x)dx$

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489. The value of $\int_0^1 \tan^{-1}\left(\frac{2x-1}{1+x-x^2}\right)dx,$ is 1 b. -1 c. 0 d. $\pi/4$

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490. Choose the correct answer The value of $\int 0 \frac{\pi}{2} \log\left(\frac{4+3\sin x}{4+3\cos x}\right) dx$

(A) 2 (B) $\frac{3}{4}$ (C) 0 (D) -2

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491. The value of $\int_{\pi/2}^{\pi/2} \left(x^3 + x\cos x + \tan^5 x + 1\right) dx,$ is 2 b. π c. 0 d. 1

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492. Evaluate the following integral: $\int_0^4 x\sqrt{4-x}\, dx$

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493. Evaluate the following integral: $\int_1^5 \frac{x}{\sqrt{2x-1}} dx$

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494. Evaluate the following integral: $\int_0^1 \tan^{-1} x \, dx$

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495. Evaluate the following integral: $\int_0^1 \tan^{-1}\left(\frac{2x}{1-x^2}\right) dx$

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496. Evaluate the following integral: $\int_0^1 \frac{1-x}{1+x} dx$

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497. Evaluate the following integral: $\int_0^{\pi/2} \frac{\sin^2 x}{(1+\cos x)^2} dx$

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498. Evaluate the following integral: $\int_0^{\pi/2} \frac{\cos x}{1+\sin^2 x} dx$

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499. Evaluate the following integrals: $\int_0^1 \sqrt{\frac{1-x}{1+x}} dx$

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500. Evaluate the following integral: $\int_0^{\pi/4} \cos^4 x \sin^3 x \, dx$

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501. Evaluate the following integral: $\int_0^{\pi/2} x^2 \cos 2x \, dx$

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502. Evaluate the following integral: $\int_2^4 \frac{x^2+x}{\sqrt{2x+1}}dx$

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503. $\int_0^1 \left(\cos^{-1}x\right)^2 dx$

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504. Evaluate the following integral: $\int_1^2 x\sqrt{3x-2}\,dx$

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505. Evaluate the following integral: $\int_0^1 \cos^{-1}x\,dx$

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506. Evaluate the following integral: $\int_0^1 \cos^{-1}\left(\frac{1-x^2}{1+x^2}\right)dx$

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507. Evaluate the following integral: $\int_0^{1/\sqrt{3}} \tan^{-1}\left(\frac{3x-x^3}{1-3x^2}\right)dx$

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508. If $\int_0^{\frac{\pi}{3}} \frac{\cos x}{3+4\sin x}dx = k\log\left(\frac{3+2\sqrt{3}}{3}\right)$, then k is equal to

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509. Evaluate the following integral: $\int_0^{\pi/2} \frac{\sin x}{\sqrt{1+\cos x}}dx$

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510. $\int_0^{\pi} \sin^3 x(1+2\cos x)(1+\cos x)^2 dx$

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511. Evaluate the following integral: $\int_0^{\pi/4} \sin 2x \sin 3x \, dx$

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512. Evaluate the following integral: $\int_1^2 \frac{1}{x^2} e^{-1/x} dx$

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513. Evaluate the following integral: $\int_0^1 \log(1+x) dx$

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514. Evaluate: $\int_0^1 x\left(\tan^{-1} x\right)^2 dx$

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515. Evaluate the following integral: $\int_1^2 \frac{x+3}{x(x+2)} dx$

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516. Evaluate the following integral: $\int_0^{\pi/4} e^x \sin x \, dx$

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517. Evaluate the following integral: $\int_0^1 |2x-1| d\,\mathrm{x}$

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518. Evaluate the following integral: $\int_0^{\pi/2} |\sin x - \cos x| dx$

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519. Evaluate the following integral: $\int_1^3 |x^2 - 4| dx$

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520. Evaluate: $\int_{-\frac{1}{2}}^{\frac{1}{2}} \cos x \log\left(\frac{1-x}{1+x}\right) dx$

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521. By using the properties of definite integrals, evaluate the integrals $\int_0^a \frac{\sqrt{x}}{\sqrt{x}+\sqrt{a-x}} dx$

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

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

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524. Evaluate the following integral: $\int_0^{15} [x^2] dx$

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525. Evaluate : $\int_0^{\frac{\pi}{2}} \frac{x \sin x \cos x}{\sin^4 x + \cos^4 x} dx$

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526. Evaluate: $\int_0^{\pi} \frac{x \tan x}{\sec x + \tan x} dx$

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527. Evaluate the following integral: $\int_0^{\pi} \cos 2x \log \sin x \, dx$

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528. Evaluate the following integral: $\int_{-\pi}^{\pi} x^{10} \sin^7 x \, dx$

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529. Evaluate the following integral: $\int_0^{\pi} \frac{dx}{6 - \cos x}$

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530. Evaluate the following integral: $\int_0^{\pi/4} \tan^4 x \, dx$

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531. Evaluate the following integral: $\int_1^3 |x^2 - 2x| dx$

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532. Evaluate the following integral: $\int_0^1 |\sin 2\pi x| dx$

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533. Evaluate the following integral: $\int_{-\pi/2}^{\pi/2} \sin^9 x \, dx$

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534. Evaluate the following integral: $\int_0^{2\pi} \cos^7 x \, dx$

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535. Evaluate the following integral: $\int_0^{\pi/2} \frac{1}{1+\tan^3 x} dx$

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536. Evaluate the following integral: $\int_0^{\pi} x \sin x \cos^4 x \, dx$

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537. Evaluate the following integral: $\int^{\pi/4} |\tan x| dx$

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538. Evaluate the following integral: $\int_0^{\pi} \frac{x}{1+\cos \alpha s \in x} dx$

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539. Evaluate the following integral: $\int_0^{\pi/2} \frac{x}{\sin x + \cos x} dx$

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540. Evaluate the following integral: $\int_{-\pi}^{\pi} x^{10} \sin^7 x \, dx$

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541. Evaluate the following integral: $\int_0^{\pi} \frac{dx}{6 - \cos x}$

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542. Evaluate the following integral: $\int_0^{\pi/4} \tan^4 x \, dx$

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543. Evaluate the following integral: $\int_1^3 |x^2 - 2x| dx$

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544. Evaluate the following integral: $\int_0^{\pi} |\sin^2 x| dx$

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545. Evaluate the following integral: $\int_{-\pi/2}^{\pi/2} \sin^9 x \, dx$

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546. Evaluate the following integrals: $\int_0^{\pi} \left(\frac{x}{1 + \sin^2 x} + \cos^7 x \right) dx$

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547. Evaluate the following integral: $\int_0^{\pi/2} \frac{1}{1+\tan^3 x} dx$

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548. Evaluate the following integral: $\int_0^{\pi} x \sin x \cos^4 x \, dx$

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549. Evaluate the following integral: $\int_{-\pi/4}^{\pi/4} |\sin x| dx$

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550. Evaluate the following integral: $\int_0^{\pi} \frac{x}{1+\cos\alpha \sin x} dx$

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551. Evaluate the following integral: $\int_0^{\pi/2} \frac{x}{\sin x + \cos x} dx$

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552. Evaluate $\int_0^{\pi} \frac{x}{a^2 - \cos^2 x} dx$

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553. The value of $\int_2^3 \frac{\sqrt{x}}{\sqrt{5-x} + \sqrt{x}} dx is\_-$

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554. Evaluate the following integral: $\int_0^{\pi/2} x \sin x + \cos^2 x$

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555. $\int_0^1 \cot^{-1}(1 - x + x^2)\,dx$

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556. Evaluate the following integral: $\int_0^{\pi/2} \frac{1}{2\cos x + 4\sin x}\,dx$

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557. Evaluate the following integral: $\int_{\pi/6}^{\pi/2} \frac{\cos ec\, x \cot x}{1 + \cos ec^2 x}\,dx$

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558. Evaluate the following integral: $\int_0^{\pi/2} \frac{dx}{4\cos x + 2\sin x}$

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559. Evaluate the following definite integrals as limit of sum: $\int_0^4 x\, dx$

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560. Evaluate the following definite integrals as limit of sum: $\int_1^4 (x^2 + x)\, dx$

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561. Evaluate the following definite integrals as limit of sums. $\int_{-1}^1 e^x dx$

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562. Evaluate the following definite integrals as limit of sum: $\int_1^3 (x^2 + 3x)\, dx$

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563. Evaluate the following definite integrals as limit of sum: $\int_0^2 (2x^2 + 3)\,dx$

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564. Evaluate the following definite integrals as limit of sum: $\int_{-1}^{1} (e^{2x}dx)$

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565. Evaluate: $\int_1^3 (2x^2 + 5x)\,dx$ as limit of a sum

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566. Evaluate the following definite integrals as limit of sum: $\int_0^2 (x^2 + 2)\,dx$

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567. Evaluate the following definite integrals as limit of sum:

$$\int_0^3 (x^2+1)\,dx$$

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Others

1. The derivative of $f(x)=\int_{x^2}^{x^3}\frac{1}{(\log)_e t}dt,\ (x>0),$ is $\frac{1}{3Inx}$ (b) $\frac{1}{3Inx}-\frac{1}{2Inx}$ (c) $(Inx)^{-1}x(x-1)$ (d) $\frac{3x^2}{Inx}$

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2. Evaluate the following integral: $\int_{-\pi/4}^{\pi/2}\sin|\sin x|\,dx$

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