MATHS

BOOKS - NAGEEN PRAKASHAN ENGLISH

INTEGRATION

Solved Example

1. Evaluate : $\int x^5 \, dx$

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2. Evaluate : $\int \sqrt{x} \, dx$

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3. Evaluate : $\int \frac{1}{x^2} \, dx$

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4. Evaluate : $\int \sqrt{1 - \cos^2 x} \, dx$

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5. Evaluate : $\int \frac{1}{\text{cosec } x} \, dx$

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6. Evaluate : $\int (6 \sin x) \, dx$

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7. Evaluate : $\int(3e^x - \frac{1}{5x} + \sec x \tan x)\, dx$

A. $e^x - \log_e x + \sec x + C$

B. $3e^x - \frac{1}{5} \log_e x + \tan x \sec x + C$

C. $3e^x - \frac{1}{5} \log_e x + \sec x + C$

D. $3e^x + \log_e x + \sec x + C$

Answer: C

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8. Evaluate : $\int \left(x + \frac{1}{x}\right)^2 dx$

A. $\frac{x^3}{3} + 2x - \frac{1}{x} + C$

B. $\frac{x^2}{2} + 2x - \frac{1}{x} + C$

C. $\frac{x^3}{3} + 2x - \frac{1}{x^{-2}} + C$

D. $(x) + 2x - \frac{1}{x} + C$

Answer: A

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9. Evaluate : $\int \frac{x^4}{x^2+1}\ \mathrm{dx}$

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10. Evaluate : $\int \frac{1}{\sin^2 x\ \ \cos^2 x)}\ \mathrm{dx}$

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11. Evaluate : $\int\left(\frac{ax^4+bx^2+C}{x^4}\right)\ \mathrm{dx}$

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12. Evaluate : $\int\frac{\cos\ 2\mathrm{x}}{\sqrt{1+\sin 2x}}\ \mathrm{dx}$

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13. Evaluate : $\int\frac{\sin\mathrm{x}}{\cos^2 x}\ \mathrm{dx}$

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14. Evaluate : $\int\frac{e^{\log\ \mathrm{x}}}{x}\ \mathrm{dx}$

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15. Evaluate : $\int \frac{4+3\sin x}{\cos^2 x}\ dx$

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16. Evaluate : $\int \frac{\sec x + \tan x}{\sec x - \tan x}\ dx$

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17. Evaluate : $\int \sec^2\ 3x\ dx$

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18. Evaluate : $\int \left(\sqrt{4-5x}\right) dx$

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19. Evaluate : $\int \frac{1}{(3x+4)^2} \, dx$

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20. Evaluate : $\int \frac{1}{\sqrt{1-9x^2}} \, dx$

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21. Evaluate : $\int \frac{1}{b^2+a^2x^2} \, dx$

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22. Evaluate : $\int \sin^2 x \, dx$

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23. Evaluate : $\int \sin 5x \ . \cos \ x \, dx$

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24. Evaluate : $\int x^3 \ \cos \ x^4 \ dx$

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25. Evaluate: $\int n. \, x^{n-1}. \ \cos \ x^n \ dx$

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26. Evaluate : $\int \frac{x}{1+x^4} dx$

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27. Evaluate: $\int \frac{\log x}{x} dx$

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28. Evaluate $\int \frac{dx}{x + \sqrt{x}}$

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29. Evaluate : $\int \frac{x^3}{1 + x^8} ds$

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30. Evaluate : $\int x^3\sqrt{x^2-4}dx$

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31. Evaluate : $\int x \ \sin^3 x^2 . \ \cos \ x^2 dx$

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32. Evaluate : $\int \frac{(1+\log x)^2}{x} - \ \mathrm{dx}$

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33. Evaluate : $\int \frac{x^4+1}{x^6+1} \ \mathrm{dx}$

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34. Evaluate: $\int \frac{x^2 \tan^{-1} x^3}{1+x^6} dx$

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35. Evaluate : $\int \frac{e^{m \sin^{-1} x}}{\sqrt{1-x^2}} ds$

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36. Evaluate : $\int \frac{1}{x^2 \cos^2\left(\frac{1}{x}\right)} dx$

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37. Evaluate : $\int \frac{x^3}{x^4+2} dx$

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38. Evaluate : $\int \frac{e^x - e^{-x}}{e^x + e^{-x}} dx$

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39. Evaluate : $\int \frac{\sin(x-a)}{\sin(x+a)} dx$

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40. $\int \frac{\sin(2x)}{a\cos^2 x + b\sin^2 x} dx =$

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41. Evaluate : $\int \frac{1}{e^x - 1} dx$

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42. Evaluate: $\int \frac{1-\tan x}{1+\tan x}\, dx$

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43. Evaluate : $\int \frac{\tan\left(\sin^{-1} x\right)}{\sqrt{1-x^2}}\, \mathrm{dx}$

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44. Evaluate : $\int \frac{\sin 2\,\mathrm{x}}{\sin 5\mathrm{x}.\ \sin 3\mathrm{x}} \mathrm{dx}$

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45. Evaluate : $\int \frac{\cos(\log x)}{x} \, dx$

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46. Evaluate : $\int \frac{1}{\cos(x+a) \cdot \sin(x+b)} \, dx$

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47. Evaluate : $\int \frac{1}{4+x^2} \, dx$

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48. Evaluate : $\int \frac{1}{\sqrt{1-e^{2x}}} \, dx$

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49. Evaluate: $\int \frac{1}{2+\cos x}\, dx$

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50. $\int \sqrt{\frac{a+x}{a-x}} dx$

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51. Evaluate : $\int \frac{1}{x^2}.\ \log\ \mathrm{x}\ \mathrm{dx}$

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52. Evaluate : $\int \cos^{-1}.\frac{1}{x} dx$

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53. Evaluate : $\int \frac{e^{1/x}}{x^3} dx$

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54. $\int \sec^3 x dx$

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55. Evaluate : $\int x \quad \sin^2 \quad \mathrm{x} \, \mathrm{dx}$

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56. Evaluate : $\int x \quad \sin^2 \quad \mathrm{x} \, \mathrm{dx}$

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57. Evaluate : $\int \sin^{-1}\sqrt{\frac{x}{a+x}}dx$

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58. Evaluate $\int e^{2x}\sin 3x dx.$

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59. Evaluate: $\int \sin(\log x)\ dx$

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60. Evaluate: $\int e^x\left(\log x+\frac{1}{x}\right)dx$

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61. Evaluate : $\int e^x \cos^2 x(\cos x - 3\sin x)dx$

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62. Evaluate: $\int \frac{x - \sin x}{1 - \cos x} dx$

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63. Evaluate: $\int \left\{ \frac{1}{\log x} - \frac{1}{(\log x)^2} \right\} dx$

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64. Evaluate: $\int \sqrt{9 - x^2} dx$

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65. Evaluate: $\int \cos x \sqrt{4 - \sin^2 x} \, dx$

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66. Evaluate: (i) $\int \sqrt{4x^2 + 9} \, dx$ (ii) $\int \sqrt{x^2 + 2x + 5} \, dx$

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67. Evaluate : $\int \sec x \tan x \sqrt{4 \sec^2 x - 1} dx$

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68. Evaluate : $\int \frac{1}{4-x^2} dx$

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69. Evaluate : $\int \frac{\sin x}{(1+\cos x)(2+3\cos x)} dx$

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70. Evaluate: $\int \frac{2x}{(x^2+1)(x^2+2)} dx$

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

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72. Evaluate : $\int (x^2)\,dx$

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73. Evaluate : $\int \frac{x}{(x-2)(x-1)^2}\,dx$

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74. Evlauate : $\int \frac{x^2+x+1}{(x-1)^3}\,dx$

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75. Evlauate : $\int \frac{x-1}{(x+1)(x^2+1)}\,dx$

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76. Evlauate :

$$\int \frac{1}{x\left[6(\log x)^2+7\log x+2\right]}dx=\log\left|\frac{1+\log x^2}{2+\log x^3}\right|+c$$

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77. Evaluate $\int \frac{1}{1+x}dx$

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78. Evaluate: $\int \frac{1}{2x^2+x-1}dx$

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79. Evaluate: (i) $\int \frac{1}{4x^2 - 4x + 3}\, dx$ (ii) $\int \frac{1}{x^2 + 4x + 8}$ (iii) $\int \frac{1}{9x^2 + 6x + 10}$

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80. Evaluate : $\int \frac{3x + 1}{2x^2 - 2x + 3} dx$

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81. Evaluate : $\int \frac{1}{\sqrt{(x-1)^2 + 3^2}} dx$

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82. $\int \frac{x + 1}{\sqrt{2x^2 + x - 3}} dx$

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83. $\int \sqrt{2x^2 - 5x - 1} dx$

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84. Evaluate : $\int \frac{1}{1 - \sin^2 x} dx$

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85. Evaluate: $\int \frac{1}{a^2 \sin^2 x + b^2 \cos^2 x} dx$

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86. Evaluate : $\int 4 \cos x dx$

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87. Evaluate : $\int \frac{1}{4+5\sin x}dx$

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88. Evaluate: $\int (x^2+1)dx$

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89. Evaluate: $\int \frac{x^3}{x^4+1}dx$

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90. Evaluate: $\int\sqrt{\tan x}\mathrm{dx}$

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91. Evaluate : $\int_0^{\pi/4}\tan x.\sec x dx$

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

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

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94. Evaluate : $\int_1^4 \frac{1}{\sqrt{x}} dx$

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

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96. Evaluate : $\int_0^a \frac{dx}{x^2 + a^2}$

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97. Evaluate: $\int_0^{\pi/4} \sqrt{1 - \sin^2 x} dx$

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98. $\int_0^2 \sqrt{6x+4}dx$

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

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

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

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102. Evaluate : $\int_0^4 x.\, e^{2x}dx$

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

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104. Evaluate : $\int_1^2 \frac{dx}{x\sqrt{x^2-1}}$

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105. Evaluate : $\int_1^2 \frac{\cos(\log x)}{x} dx$

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106. Evaluate : $\int_0^{\pi/6} \frac{\cos x}{3 + 4\sin x} dx$

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107. $\int_0^1 \frac{x}{\sqrt{1 + x^2}} dx$

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108. Evaluate : $\int_0^{\pi/2} \sin^3 x \cos x dx$

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109. Evaluate : $\int_0^1 \frac{x^2}{1+x^6} dx$

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110. Evaluate $\int_0^1 \frac{\sin^{-1} x}{\sqrt{1-x^2}} dx.$

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

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

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113. Evaluate : $\int_0^1 \frac{e^{\sqrt{x}}}{\sqrt{x}} dx$

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

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115. Evaluate : $\int_0^9 \frac{1}{1+\sqrt{x}} dx$

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116. Evaluate : $\int_0^1 \cos^{-1} dx$

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117. Evaluate $\int_0^{\pi/2} \frac{\cos x}{(1+\sin x)(2+\sin x)} dx.$

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

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119. Prove that: $\int_0^{\pi/2} \frac{\sin x}{\sin x + \cos x} ddx = \frac{\pi}{4}$

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120. Prove that: $\int_0^{\pi/2} \frac{1}{1+\tan^3 x} = \frac{\pi}{4}$

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121. Prove: $\int_0^{\pi/2} \log|\tan x|\, dx = 0$

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122. $\int_{a/4}^{3a/4} \frac{\sqrt{x}}{\sqrt{a-x}+\sqrt{x}}\, dx = \frac{a}{4}$

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123. Prove that: $\int_{-a}^{a} x^3\sqrt{a^2-x^2}dx = 0$

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124. Prove that: $\int_{-a}^{a} \log\left(\frac{2-x}{2+x}\right)dx = 0$

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125. Prove that: $\int_{0}^{\infty} \frac{x}{(1+x)(1+x^2)}dx = \frac{\pi}{4}$

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126. 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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127. Evaluate : $\int_0^{\frac{\pi}{2}} \frac{\sin^2 x}{s \in x + \cos x} dx$

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128. Evaluate: $\int_0^1 |5x - 3| dx$ (ii) $\int_0^{\pi} |\cos x| dx$ (iii) $\int_{-5}^{5} |x - 2| dx$ (iv) $\int_{-1}^{1} e^{|x|} dx$ (v) $\int_0^2 |x^2 + 2x - 3| dx$ (v) $\int_1^4 (|x - 1| + |x - 2| + |x - 3|) dx$ (vi) $\int_{-1}^{2} |x^3 - x| dx$

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129. Evaluate : $\int_0^{\pi} |\cos x| dx$

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130. Prove that $\int_0^{\pi/8} \log|1+\tan 2x|\, dx = \frac{\pi}{16}\log_e 2.$

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131. Evaluate $\int_a^b x^2 dx$ as limit of the sum.

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132. Evaluate: $\int_a^b e^x dx$ using limit of sum

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133. Evaluate : $\int_{-1}^{2} e^x dx$ as a limit of sum.

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Exercise 7a

1. $\int \mathrm{x}\,\mathrm{dx}$

A. $\frac{x^2}{2} + c$

B. $\left(x^2\right) + c$

C. $x + c$

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

Answer: A

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2. $\int x^8 \,\mathrm{dx}$

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3. $\int x^{-6}\ \mathrm{dx}$

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4. $\int \frac{1}{x\sqrt{x}} dx$

A. $-\left(\frac{1}{2}\right)x^{-1/2}+c$

B. $-2x^{-1/2}+c$

C. $-1x^{-1/2}+c$

D. $-\frac{1}{3}.\ x^{-1/2}+c$

Answer: B

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5. $\int \frac{1}{\sqrt{x}} dx$

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6. $\int z^{-1/3} \, \mathrm{dz}$

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7. $\int 2^{x} \, \mathrm{dx}$

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8. $\int b^{x+a} \, \mathrm{dx}$

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9. $\int \frac{1}{\sqrt{1-y^2}} dy$

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10. $\int \frac{1}{t\sqrt{t^2-1}} dt$

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11. $\int \sec^2 \quad \mathrm{z}\, \mathrm{dz}$

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12. $\int \frac{1}{\cos x . \cot x} dx$

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13. $\int \frac{1}{4^{-x}} dx$

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14. $\int \frac{1}{e^{-x}} dx$

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Exercise 7b

1. $\int \left(x^6 - \frac{1}{x} + e^x + 3 \right) dx$

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2. Find the integral $\int (ax^2 + bx + c)\,dx$

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3. $\int (3x - 2)^3\,dx$

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4. Evaluate $\int \tan^2 x\,dx$

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5. $\int \left(\frac{3x - 2}{x} + e^x \right) dx$

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6. $\int \frac{1}{1-\sin x} dx$

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7. $\int \frac{\sec x - \tan x}{\sec x + \tan x} dx$

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8. $\int \frac{x^2}{1+x^2} dx$

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9. $\int \sqrt{1+\sin 2x} dx$

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10. Evaluate : $\int \frac{1}{1+\cos tx} dx$

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11. $\int \frac{x^2+3}{x^2+1} dx$

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12. $\int \frac{x}{x+a} dx$

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13. $\int \frac{x^2+2x-5}{\sqrt{x}} dx$

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14. $\int(\tan x + \cos x)^2 dx$

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15. $\int \frac{1}{1+\cos 2x} dx$

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16. $\int \frac{1}{1-\cos 2x} dx$

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17. $\int \sqrt{1+\cos 2x} dx$

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18. $\int \sqrt{1-\cos 2x}\,dx$

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19. $\int \frac{2-3\cos x}{\sin^2 x}\,dx$

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20. $\int \frac{1+\cos 2x}{1-\cos 2x}\,dx$

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21. $(i)\int \frac{\cos^3 x+\sin^3 x}{\sin^2 x.\cos^2 x}\,dx$ $(ii)\int \frac{\cos 2x}{\cos^2 x \sin^2 x}\,dx$

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22. $\int \frac{(x+1)(2x-3)}{x} dx$

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23. $\int e^{x+3} dx$

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24. $\int \frac{\sin x}{1+\sin x} dx$

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25. $(i) \int \frac{(1+x)^3}{\sqrt{x}} dx$ $(ii) \int \frac{(1+x)^3}{x^4} dx$

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26. $\int \frac{1-x}{\sqrt{x}} dx$

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Exercise 7c

1. Evaluate: $\int (ax+b)^3 dx$

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2. $\int (3-7x)^5 dx$

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3. $\int \sqrt{2x-1} dx$

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4. $\int \frac{1}{(a+bx)^5} dx$

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5. $\int \sqrt{2x+\frac{1}{3}} dx$

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6. $\int \frac{1}{(7x-2)^2} dx$

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7. $(i) \int \frac{1}{5x+1} dx \qquad (ii) \int \frac{1}{\sqrt{x+1}+\sqrt{x}} dx$

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8. $\int \frac{1}{\sqrt{5-.\frac{x^2}{4}}} dx$

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9. $\int \frac{1}{3+(2-3x)^2} dx$

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10. $\int \cos(2x+1)dx$

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11. $\int \sec^2(1-5x)dx$

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12. Evaluate $\int \cos^3 x dx.$

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13. $\int \cos 4x . \cos 2x dx$

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14. $(i) \int \sin 2x . \cos 5x dx \qquad (ii) \int \frac{\sin 4x}{\sin x} dx$

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15. $\int \sqrt{1+\sin x} dx$

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16. $(i) \int \sqrt{1+\sin . \frac{x}{2}} dx$

$(ii) \int \frac{1+\cos 4x}{\cot x - \tan x} dx$

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17. $\int e^{2x+5} dx$

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18. $\int e^{4-3x} dx$

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19. Evaluate: $\int \frac{1+x+x^2}{x^2(1+x)} dx$

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20. $\int \{5a^x + 6a\cos(5x+1)\} dx$

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21. $\int \frac{1dx}{(x-2)\sqrt{x^2-4x+3}}$

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22. $\int \frac{1}{\sqrt{1-(3x+2)^2}}dx$

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23. If $f'(x) = \frac{1}{x} + x^2$ and $f(1) = \frac{4}{3}$ then find the value of $f(x)$

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Exercise 7d

1. $\int \cos^3 x . \sin x dx$

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2. $\int x^2 . \sin x^3 dx$

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3. $\int \cos ec^2 x . \sqrt{\cot} dx$

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4. $\int \cot^3 x . \cos ec^2 x dx$

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5. $\int \frac{x^2}{1+x^6} dx$

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6. $\int \frac{(\log_e x)^3}{x} dx$

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7. $\int \frac{x^2}{\sqrt{1+x^3}} dx$

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8. $\int \sec x . \log(\sec x + \tan x) dx$

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9. $\int \frac{x}{\sqrt{1+x^2}} dx$

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10. $\int \frac{x^2}{1-2x^3} dx$

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11. $\int \frac{x}{\sqrt{1+x^2}} dx$

Watch Video Solution

12. $\int x^2 . \tan^2 x^3 . \sec^2 x^3 dx$

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Watch Video Solution

13. $\int \frac{x}{\sqrt{1+x^4}} dx$

Watch Video Solution

14. $\int x \cos^3 x^2 . \sin x^2 dx$

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15. $\int \frac{x^3}{(4-x^4)^2} dx$

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16. $\int \frac{1}{x \cos^2(\log_e x)} dx$

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17. $\int \frac{\cos^2(\log. x)}{x} dx$

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18. $(i) \frac{\log x . \sin\left[1 + (\log x)^2\right]}{x} dx$

$(ii) \int \frac{dx}{x(1 + \log)^n}$

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19. $\int \frac{1}{\cos^2 x (1 - \tan x)^2} dx$

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20. $\int \frac{x\,dx}{(1+x^2)^{3/2}}$

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21. Evaluate: (i) $\int \frac{\sin x}{1+\cos^2 x}\,dx$ (ii) $\int \frac{2x^3}{4+x^8}\,dx$

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22. Evaluate: (i) $\int \frac{e^{\sqrt{x}}\cos\left(e^{\sqrt{x}}\right)}{\sqrt{x}}\,dx$ (ii) $\int \frac{\cos^5 x}{\sin x}\,dx$

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23. $\int e^x.(a+be^x)^n dx$

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24. $(i) \int \frac{\tan^{-1}}{(1+x^2)} dx \qquad (ii) \int \frac{1}{\sqrt{1-x^2}\sin^{-1} x} dx$

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25. $\int \frac{\sin x . \cos x}{a^2 \cos^2 x + b^2 \sin^2 x} dx$

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26. $\int \cos^2 x dx$

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27. $\int \sin^2 nx dx$

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28. $\int \sin^5 x dx$

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29. $\int \frac{\left(a + b \sin^{-1} x\right)^n}{\sqrt{1 - x^2}} dx$

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30. $\int \text{cosec}^4 2x dx$

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31. Evaluate: $\int \sec^4 x \, dx$

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32. $\int \sin^{2/3} x \cos^3 x dx$

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33. $\int \cos 2x . \cos 4x . \cos 6x dx$

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34. $\int \frac{2x-1}{\sqrt{x^2-x-1}} dx$

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35. $\int \cos^4 \ 2x \, dx$

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36. $\int \cos^3(3x+5)dx$

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37. Evaluate: (i) $\int \frac{1}{x^2}\cos^2\left(\frac{1}{x}\right)dx$ (ii) $\int \sec^4 x \tan x \, dx$

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38. $\int \frac{2x^3}{(x^2+1)^2}dx$

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Exercise 7e

1. $(i) \int \frac{e^x}{1+e^x} dx \qquad (ii) \int \frac{e^x}{(1+e^x)^4} dx$

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2. $\int \frac{\cot x}{\log(\sin x) dx}$

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3. $\int \frac{\sin x}{a + b\cos x} dx$

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4. $\int \frac{x^2}{(x^3+4)^3} dx$

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5. $\int \frac{e^x(1+x)}{\sin^2(xe^x)} dx$

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6. $\int \frac{\sec^2 x}{\sqrt{\tan x}} dx$

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7. $(i) \int \frac{1}{(1+x^2)\tan^{-1} x} dx \qquad (ii) \int \frac{e^{\tan^{-1} x}}{1+x^2} dx$

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8. $\int \frac{e^x + \cos x}{e^x + \sin x} dx$

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9. (i) $\int \frac{\sec x \cdot \cos ecx}{\log \cot x} dx$ (ii) $\int \tan^4 x \, dx$

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10. $\int \frac{\cos x}{1 + \sin x} dx$

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11. Evaluate: $\int \frac{\sin x}{\sin(x - a)} \, dx$

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12. Evaluate: $\int \frac{a}{b+ce^x} dx$

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13. $(i) \int \frac{1}{\sqrt{1-x^2}.\cos^{-1} x} dx$

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

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14. $\int \frac{\sin 2x}{5-\cos^2 x} dx$

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15. $(i) \int \frac{\cos x - x \sin x}{x \cos x} dx \qquad (ii) \int \frac{1 + \cos x}{(x + \sin x)^3} dx$

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16. $\int \frac{x^{e-1} - e^{x-1}}{x^e - e^x} dx$

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Exercise 7f

1. $\int \frac{\tan(1 + \log x)}{x} dx$

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2. $\int \frac{1}{\sqrt{1+\cos 2x}} dx$

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3. $(i) \int \sec^7 x . \sin x dx \qquad (ii) \int \frac{1}{\sin x . \cos^2 x} dx$

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4. Evaluate

$$\int \frac{1}{\cos(x-a)\cos(x-b)} dx$$

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5. Evaluate: $\int \frac{1}{\sqrt{4x^2-9}} dx$

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6. $\int \frac{1}{\sqrt{x^2-9}} dx$

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7. $\int \frac{1}{5+4\cos x} dx$

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8. Evaluate: $\int \frac{1}{\sin(x-a)\sin(x-b)} dx$

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9. $\int \frac{1}{4x^2+9} dx$

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10. $\int \frac{x^2 dx}{4 + x^2}$

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11. Evaluate: $\int \frac{1}{\sqrt{4x^2 - 9}} dx$

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12. $\int \frac{1}{\sqrt{9x^2 - 1}} dx$

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13. Evaluate: (i) $\int \frac{e^x}{\sqrt{4-e^{2x}}}\,dx$ (ii) $\int \frac{x^2}{\sqrt{1-x^6}}\,dx$

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14. Evaluate: $\int \frac{1}{e^x+e^{-x}}\,dx$

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15. $\int \sqrt{\frac{x+1}{x-1}}dx$

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16. $\int \frac{1}{x^2(x^4+1)^{\frac{3}{4}}}dx$

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17. Evaluate $\int \frac{1}{1+\sin x} dx.$

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18. $(i) \int \frac{\sin x}{\sqrt{4+\cos^2 x}} dx \quad (ii) \int \frac{x^2}{\sqrt{9+x^6}} dx$

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19. $(i) \int \frac{2\cos x}{\sqrt{1-4\cos^2 x}} dx \quad (ii) \int \frac{x+1}{\sqrt{x^2+1}} dx$

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20. Evaluate: (i) $\int \frac{1}{\sqrt{1+\cos 2x}} dx$ (ii) $\int \frac{1}{\sqrt{1-\cos x}} dx$

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21. $\int \sec^{6/5} x . \operatorname{cosec}^{4/5} x dx$

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22. Evaluate: $\int \frac{x^2}{(a+bx)^2} dx$

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23. $\int \frac{x^2+1}{(x+1)} dx$

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24. $\int \sqrt{1+2\tan x(\tan x+\sec x)} dx$

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Exercise 7g

1. $\int \log_e \ x \ dx$

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2. Evaluate : $\int x^n \log x dx.$

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3. $\int x. \ a^x dx$

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4. $\int \mathrm{x}\ \sec^2\ \mathrm{x}\ \mathrm{dx}$

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5. Evaluate: $\int x \log(1+x)\, dx$

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6. $\int \mathrm{x}\ \sec^2\ \mathrm{x}\ \mathrm{dx}$

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7. $\int x \tan^{-1} x dx$

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8. Evaluate: (i) $\int \sec x \log(\sec x + \tan x)\, dx$ (ii) $\int \cos ec\, x \log(\cos ec\, x - \cot x)\, dx$

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9. $\int \sin \sqrt{x} dx$

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10. $(i) \int x^2 \cos x\, dx$ $(ii) \int x^2 e^{3x}\, dx$

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11. $(i) \int x \sec^2 2x\, dx$ $(ii) \int x \sin^3 x\, dx$

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12. Evaluate $\int \sin^{-1} x dx$.

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13. $\int \cot^{-1} x \, dx$

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14. $\int x^3 e^{x^2} dx$ is equal to

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15. $\int \sin^{-1}\left(\frac{2x}{1+x^2}\right) dx is equa < o$

$x\tan^{-1}x - \ln\left|\sec\left(\tan^{-1}x\right)\right| + c$

$x\tan^{-1}x + \ln\left|\sec\left(\tan^{-1}x\right)\right| + c$

$x\tan^{-1}x - \ln\left|\cos\left(\tan^{-1}x\right)\right| + c$ none of these

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

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17. $\int \tan^{-1}\left(\frac{3x-x^3}{1-3x^2}\right) dx$

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18. Evaluate $\int \frac{x^2 \tan^{-1} x}{1+x^2} dx.$

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19. $\int \frac{\sin^{-1} x}{(1-x^2)^{3/4}} dx$

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20. Evaluate $\int \frac{x \tan^{-1} x}{(1+x^2)^{\frac{3}{2}}} dx$

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21. $\int \text{cosec}^3 \text{ x dx}$

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22. $\int \sec(\tan^{-1} x)\, dx$

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23. Evaluate: $\int \left(\frac{x \tan^{-1} x}{(1+x^2)^{3\backslash 2}} \right) dx$

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24. $\int e^{3x} \cos 2x\, dx$

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25. Evaluate $\int e^{2x} \sin 3x dx.$

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26. $\int \frac{x}{(1+\sin x)} dx$

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27. $\int e^{\sqrt{x}} dx$

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28. Evaluate $\int e^{2x} \sin 3x dx.$

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29. $\int \log \sin x \, . \sec^2 x \, dx$

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30. $\int e^{\sin x} \cdot \sin 2x \, dx$

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31. $\int e^x \cdot \cos^2 x \, dx$

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Exercise 7h

1. $\int e^x \cdot (\cot x - \operatorname{cosec}^2 x) \, dx$

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2. $\int e^x . \quad \sin x(\sin x + 2\cos x)\, dx$

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3. $(i) \int e^x . [\log(\sec x + \tan x) + \sec x\, dx$

$(ii) \int \frac{e^{-x}(\cos x - \sin x)}{\cos^2 x} dx$

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4. $\int e^x (\log \sin x + \cot x) dx$

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5. Evaluate: $\int e^x \left(\frac{\sin x \cos x - 1}{\sin^2 x} \right) dx$

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6. Evaluate: $\int\{s \in (\log x) + \cos(\log x)\}dx$

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7. $\int\frac{2x - \sin 2x}{1 - \cos 2x}dx$

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8. Evaluate: $\int e^x \frac{x^2 + 1}{(x + 1)^2}\, dx$

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9. $\int\left(\frac{\log x}{(1 + \log x)^2}\right)dx$

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10. $\int \frac{x-2}{x^3} . e^x dx$

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11. $\int e^{2x} \quad (\tan x+1)^2 dx$

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12. Evaluate $\int \frac{x+\sin x}{1+\cos x} dx$

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13. $(i) \int \frac{e^x . (1-x)}{x^2} dx$

$(ii) \int \left(\frac{1+\sin x}{1+\cos x} \right) e^x dx$

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14. The value of $\int e^{\tan^{-1} x} \left(\frac{1+x+x^2}{1+x^2} \right) dx$

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15. Find $\int \left[\log(\log x) + \frac{1}{(\log x)^2} \right] dx$

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Exercise 7i

1. $\int \sqrt{9-4x^2}dx$

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2. $\int x\sqrt{x^4+9}dx$

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3. $\int \sec x \tan x \sqrt{\tan^2 x - 4}dx$

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4. Evaluate: $\int x^2\sqrt{a^6-x^6}dx$

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5. $\int \frac{x^2+1}{\sqrt{x^2+3}} dx$

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6. $\int x^2 \sqrt{x^6-1} dx$

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7. $\int \sec x \tan x \sqrt{\sec^2 x + 1} dx$

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8. $\int \sqrt{2-3x^2} dx$

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Exercise 7j

1. Evaluate: (i) $\int \frac{1}{a^2 - b^2 x^2} dx$ (ii) $\int \frac{1}{a^2 x^2 - b^2} dx$

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2. Evaluate: $\int \frac{1}{2x^2 - x - 1} dx$

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3. $\int \frac{1}{x - x^3} dx$

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4. Evaluate : $\int \frac{2x-3}{x^2+3x-18}\,dx$

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5. Evaluate: $\int \frac{x^2+1}{x^2-1}\,dx$

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6. $\int \frac{x}{(x^2-a^2)(x^2-b^2)}dx$

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7. $\int \frac{x}{(x-2)(x+1)}dx$

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8. $\int \frac{2x+3}{(x+2)(x-2)}dx$

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9. $\int \frac{1}{(x-2)(x+2)(x-2)}dx$

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10. $\int \frac{\cos x}{(1+\sin x)(2+\sin x)}dx$

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11. $\int \frac{dx}{x(1+\log_e x)(3+\log_e x)}$

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12. $\int \frac{x^3+3}{x^3-3x} dx$

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13. Find $\int \frac{x^2}{(x^2+1)(x^2+4)dx}$

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14. $\int \frac{x^2}{x^6+x^3-2} dx$

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15. $\int \frac{e^x dx}{e^{2x}+4e^x+3}$

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

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17. $\int \frac{1}{(x+1)^2-4}dx$

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18. Evaluate: $\int \frac{\cos x}{\cos 3x}\,dx$

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19. $\int \frac{1}{1+3e^x+2e^{2x}}dx$

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20. Evaluate: $\int \frac{1}{\sin x(3+2\cos x)\,dx}$

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21. Evaluate: $\int \frac{1}{x\,(x^4+1)}\,dx$

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22. $Solve: (i) \int \frac{1}{x(x+1)^2}dx$

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23. $\int \frac{x}{x^2+2x+1} dx$

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24. $\int \frac{\sin x}{\sin(3x)} dx =$

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25. Evaluate: $\int \frac{x^2}{(a+bx)^2} dx$

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26. Evaluate: $\int \frac{x+1}{x(1+xe^x)^2} dx$

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27. Evaluate: $\int \frac{1}{1+x+x^2+x^3} dx$

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28. Evaluate: $\int \frac{1}{x^4-1} dx$

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29. $\int \frac{1}{(x+b)(x^2+a^2)} dx$

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30. $\int \frac{1-\cos x}{\cos x(1+\cos x)} dx$

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Exercise 7k

1. *Evaluate*: $\int \frac{1}{x^2+2x+5} dx$

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2. *Evaluate*: $\int \frac{1}{5+4x+x^2} dx$

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3. $\int \frac{1}{2x^2+5x+3}dx$

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4. $\int \frac{1}{2x^2+x+1}dx$

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5. Evaluate $\int \frac{dx}{1-x-x^2}$

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6. $\int \frac{1}{2x^2-4x+1}dx$

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7. $\int \frac{4x-3}{3x^2+2x-5}dx$

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8. Evaluate: $\int \frac{x+1}{x^2+4x+5}dx$

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9. $\int \frac{3x+1}{2x^2+x-1}dx$

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10. $\int \frac{2x-1}{2x^2+2x+1}dx$

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11. Evaluate: $\int \frac{x}{x^4 + x^2 + 1} dx$

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12. $\int \frac{1}{\sqrt{4x^2 - x + 4}} dx$

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13. $\int \frac{1}{\sqrt{2 + x - 3x^2}} dx$

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14. $\int \frac{1}{\sqrt{1 + x - x^2}} dx$

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15. $\int \frac{1}{\sqrt{2x^2+3x-2}}dx$

Watch Video Solution

16. $\int \frac{1}{\sqrt{x^2+3x+1}}dx$

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17. Evaluate: $\int \frac{2x+5}{\sqrt{x^2+2x+5}}\,dx$

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18. $\int \frac{x+1}{\sqrt{2x^2+x-3}}dx$

Watch Video Solution

Watch Video Solution

19. $\int \frac{2x+5}{\sqrt{x^2+3x+1}} dx$

Watch Video Solution

20. $\int \frac{x}{\sqrt{x^2+x+1}} dx$

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21. $\int \sqrt{5-2x+x^2} dx$

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22. $\int \sqrt{x^2+4x+1} dx$

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23. $\sqrt{2ax - x^2}dx$

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24. $\int (x+2)\sqrt{x^2+x}dx$

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25. Evaluate: $\int (x-5)\sqrt{x^2+x}\,dx$

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26. Evaluate: $\int (4x+1)\sqrt{x^2-x-2}\,dx$

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27. Evaluate: $\int (2x-5)\sqrt{2+3x-x^2}\,dx$

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Exercise 7I

1. $\int \frac{1}{1+3\cos^2 x}\,dx$

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2. $\int \frac{1}{(2\sin x+\cos x)^2}\,dx$

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3. $\int \frac{1}{(a\sin x + b\cos x)^2}\,dx$

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4. $\int \frac{1}{2+\sin^2 x}\,dx$

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5. $\int \frac{1}{3\sin^2 x + 4\cos^2 x}\,dx$

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6. $\int \frac{1}{\sin^2 x - 4\cos^2 x}\,dx$

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7. $\int \frac{1}{\cos^2 x - 3\sin^2 x} dx$

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8. $\int \frac{1}{\sin x \cos x + 2\cos^2 x} dx$

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9. $\int \frac{1}{(\sin x - 2\cos x)(2\sin x + cosx)} dx$

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10. $\int \frac{1}{5 + 2\cos x} dx$

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11. $\int \frac{1}{5-4\sin x}dx$

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12. Evaluate: $\int \frac{1}{13+3\cos x+4\sin x}dx$

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13. $\int \frac{1}{3+2\sin x+\cos x}dx$

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14. Evaluate: $\int \frac{dx}{2+\cos x}$ dx

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15. $\int \frac{1}{4+5\cos x} dx$

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16. $\int \frac{1}{3+4\sin x} dx$

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17. Prove that :

$$\int \frac{2\sin x + 3\cos x}{3\sin x + 4\cos x} dx = \frac{18x}{25} + \frac{1}{25}\log|3s\sin x + 4\cos x|c$$

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Exercise 7m

1. $\int \frac{x^2+1}{x^4-2x^2+1}dx$

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

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3. Evaluate: $\int \frac{\left(x^2-1\right)}{x^4+x^2+1}\,dx$

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4. Evaluate: $\int \frac{1}{x^4-1}dx$

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5. $\int \sqrt{\cot x} dx$

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6. Evaluate: $\int \frac{x^2+4}{x^4+16} dx$

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7. Evaluate: $\int \left(\sqrt{\tan x} + \sqrt{\cot x}\right) dx$

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

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Exercise 7n

1. $\int_1^3 \frac{1}{x}dx$

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2. $\int_0^a y^2 dy$

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3. Evaluate the following :

$$\int_0^{\pi/4} \tan x \, dx$$

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4. $\int_0^{\pi/2} \sqrt{1-\sin 2x}\,dx$ is equal to :

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5. $\int_0^{\pi} \sin 3x\,dx$

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6. $\int_{\pi/6}^{\pi/2} \cos x\,dx$

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7. $\mathrm{Find} \int_4^9 \sqrt{x} dx$

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

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9. $\int_{-\pi/4}^{\pi/4} \mathrm{cosec}^2 x dx$

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10. $\int_0^{\pi/2} \cos 3x dx$

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11. $\int_0^{\pi/4} \sin^2 x dx$

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

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

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14. $\int_0^{\pi/2} \sin^4 x dx$

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

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16. $\int_0^a \frac{dx}{\sqrt{ax-x^2}}$

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17. $(i) \int_0^{\pi/2} x \cos x dx$

(i) $\int_1^3 x.\log x dx$

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18. $(i) \int_0^{\pi/2} x \sin x \cos x dx$

$(ii) \int_0^{\pi/6} (2+3x^2)\cos 3x dx$

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

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20. $\int_{-1}^{2} \sqrt{5x+6}dx$

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21. $\int_{0}^{\pi/2} \sin^2 x dx$

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22. $\int_{0}^{\pi/6} \cos x \cos 3x dx$

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23. Evaluate $\int_{0}^{\pi/4} \frac{dx}{1+\cos 2x}$

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

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

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

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

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28. $\int_1^2 \frac{1}{x(1+x)} dx$

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

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30. $\int_0^{\pi/2} x^2 \cos x dx$

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31. $\int_1^e \frac{e^x(1+x\log x)}{x}dx$

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32. $\int_a^{2a}\left(\sqrt{\frac{a}{x}}+\sqrt{\frac{x}{a}}\right)^2 dx$

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Exercise 7o

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

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

A. -a

B. a

C. 2a

D. 0

Answer: B

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3. Evaluate the integrals $\int 0 \frac{\pi}{2} \frac{\sin x}{1 + \cos^2 x} dx$

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4. $\int_0^{\pi/2} \sin^2 x \cos^2 x dx$

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5. $\int_0^{\pi/4} \cot x. \quad \text{cosec}^2 x dx$

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6. $\int_0^{\pi/2} \frac{dx}{4\sin^2 x + 5\cos^2 x}$

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7. Evaluate $\int_0^1 \frac{dx}{e^x + e^{-x}}$

Watch Video Solution

8. $\int_{1/e}^{e} \frac{dx}{x(\log x)^{1/3}}$

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9. $\int_{1}^{2} \frac{dx}{x(1+\log x)^{2}}$

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10. $\int_{\pi/6}^{\pi/2} \frac{\text{cosec x cot x}}{1+\text{cosec}^{2}x} dx$

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11. What is ∫ln(x)/x^2 dx ?

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12. $\int \frac{x \sin^{-1} x}{\sqrt{1-x^2}} dx$

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13. $\int_0^2 \frac{e^{-1/x}}{x^2} dx$

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14. $\int_1^2 \frac{x}{\sqrt{1+2x^2}} dx$

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15. $\int_{-1}^{2} \frac{x}{(x^2+1)^2} dx$

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16. Find : $\int_{0}^{\frac{1}{\sqrt{2}}} \frac{\sin^{-1} x}{(1-x^2)^{\frac{3}{2}}} dx$

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17. $\int_{0}^{\pi} \frac{1}{5+2\cos x} dx$

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18. $\int_{0}^{\pi/2} e^x (\sin x + \cos x) dx$

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

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20. Evaluate :

(i) $\int_0^1 \sin^{-1} x dx$, (ii) $\int_1^2 \frac{\ln x}{x^2} dx$, (iii) $\int_0^1 x^2 \sin^{-1} x dx$.

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

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22. $\int_0^1 \frac{1}{x^2+2x+3}dx$

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23. $\int_0^{\pi/2} \frac{1}{4+3\cos x}dx$

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24. $\int_0^{\pi/4} e^x\left(\tan x+\sec^2 x\right)dx$

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

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

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27. $\int_0^{\pi/2} x \sin x \cos x dx$

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

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29. $\int_0^1 x\sqrt{\frac{1-x^2}{1+x^2}}dx$

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30. $\int_0^{\pi} x \sin x \cos^2 x dx$

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Exercise 7p

1. Prove that : $\int_0^{\pi/2} \frac{\sqrt{\tan x}}{\sqrt{\tan x + \sqrt{\cot x}}} dx = \frac{\pi}{4}$

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2. Prove that : $\int_0^{\pi/2} \frac{dx}{1 + \cot x} = \frac{\pi}{4}$

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

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

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5. Prove that : $\int_0^{\pi/2} \frac{\cos^5}{\sin^5 x + \cos^5 x} dx = \frac{\pi}{4}$

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6. Prove that: $\int_0^{\pi/2} \frac{1}{1 + \tan^3 x} = \frac{\pi}{4}$

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7. Prove that : $\int_0^{\pi/2} \frac{\sin x - \cos x}{1 + \sin x \cos x} dx = 0$" (ii) Prove that " : int_(0)^(pi//2) sin 2x. log (tan-x) dx=0`

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8. Prove that : $\int_0^{\pi} x \cos^2 x dx = \frac{\pi^2}{4}$

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9. Prove that : $\int_0^{a} \frac{\sqrt{x}}{\sqrt{x} + \sqrt{a - x}} dx = \frac{a}{2}$

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10. Prove that : $\int_0^{\pi} \sin^2 x . \cos x dx = 0$

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11. Prove that :

$\int_0^{\pi/2} (\sin x - \cos x) \log\left(\sin^3 x + \cos^3 x\right) dx = 0$

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12. Prove that : $\int_0^{\pi} \sin^{2m} x . \cos^{2m+1} x dx = 0$

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13. Prove that : $\int_2^7 \frac{\sqrt{x}}{\sqrt{9-x} + \sqrt{x}} dx = \frac{5}{2}$

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14. Prove that : $\int_{\pi/4}^{3\pi/4} \frac{1}{1+\cos x} dx = 2$

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15. Evaluate : $\int_{\frac{\pi}{4}}^{\frac{3\pi}{4}} \frac{x}{1+\sin x} dx$

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16. Prove that : $\int_0^{\pi} \frac{x \sin x}{1+\cos^2 x} dx = \frac{\pi^2}{4}$

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17. Prove that : $\int_0^{\pi/2} \frac{x}{\sin x + \cos x} dx = \frac{\pi}{4\sqrt{2}} \log \left| \frac{\sqrt{2}+1}{\sqrt{2}-1} \right|$

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18. Prove that : $\int_0^a \frac{dx}{x + \sqrt{a^2 - x^2}} = \frac{\pi}{4}$

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19. Prove that $\int_0^{\frac{\pi}{2}} \frac{\sin^2 x}{1 + \sin x \cos x} dx = \frac{\pi}{3\sqrt{3}}$

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20. Evaluate : $\int_0^1 (1-x)^{3/2} dx$

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21. Evaluate : $\int_0^1 \log\left(\frac{1}{x}-1\right)dx$

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

Watch Video Solution

23. Evaluate : $\int_0^4 x(4-x)^{3/2} dx$

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24. Prove that :$(i)\int_{-\pi}^{\pi} x^{10}\sin^7 x dx = 0$

$(ii)\int_{-\pi}^{\pi}\left(\sin^{25} x + x^{75}\right)dx = 0$

$(iii)\int_{-\pi}^{\pi} e^{|x|}dx = 2(e-1)$

$(iv)\int_{-\pi/2}^{\pi/2}\sin^9 x dx = 0$

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

Watch Video Solution

26. Prove that : $\int_0^{\pi}\frac{x}{1+\sin^2 x}dx = \frac{\pi^2}{2\sqrt{2}}$

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27. Prove that : $\int_0^{\pi} \frac{x \sin x}{1+\sin x} dx = \pi\left(\frac{\pi}{2} - 1\right)$

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

Watch Video Solution

29. Evaluate : $\int_0^8 |x - 5| dx$

Watch Video Solution

30. Evaluate : $\int_{-\pi/4}^{\pi/4} |\sin x| dx$

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31. If $f(x) = \begin{cases} 2x + 1.1 \leq x \leq 2, \\ x^2 + 1.2 \leq x \leq 3 \end{cases}$ then evaluate $\int_1^3 f(x)dx.$

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32. if f(x) = $\left\{ \begin{array}{ll} 3x+4 & 0 \leq x \leq 2 \\ 5x & 2 \leq x \leq 3 \end{array} \right\}$, then evaluate $\int_0^3 f(x)dx.$

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33. Prove that : $\int_0^1 \frac{\log x}{\sqrt{1-x^2}} dx = -\frac{\pi}{2}\log 2$

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34. Prove that : $\int_0^{\pi/2} x.\cot x dx = \frac{\pi}{2}\log 2$

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35. Prove that : $\int_0^1 \frac{\sin^{-1} x}{x} dx = \frac{\pi}{2}\log 2$

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36. Prove that : $\int_0^{\pi} \frac{x}{a^2\cos^2 x + b^2 \sin^2 x} dx = \frac{\pi^2}{2ab}$

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

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38. Evaluate $\int_0^{\pi} \frac{x dx}{1+\cos\alpha \sin x}$,where $0 < \alpha < \pi$.

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39. Prove that : $\int_0^{\infty} \log\left(x+\frac{1}{x}\right).\frac{dx}{1+x^2} = \pi \log_e 2$

Watch Video Solution

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

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Exercise 7q

1. $\int_2^4 x dx$

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

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3. $\int_1^4 (2x^2 + 1) dx$

Watch Video Solution

4. $\int_1^5 (x^2 - 2x) dx$

Watch Video Solution

5. $\int_0^2 e^x dx$

Watch Video Solution

6. $\int_{-1}^2 e^{-x} dx$

Watch Video Solution

7. $\int_a^b \sin x dx$

Watch Video Solution

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

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Exercise 7r

1. Evaluate: (i) $\sqrt{1-\cos 2x}\,dx$ (ii) $\int\sqrt{1+\sin 2x}\,dx$

A. $\sin x - \cos x + c$

B. $\cos x - \sin x + c$

C. $-\sin x - \cos x + c$

D.

Answer: B

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2. $\int\frac{3-4\sin x}{\cos^2 x}dx = ?$

A. $4\tan x + 4\sec x + c$

B. $3\tan x + 4\sec x + c$

C. $4\tan x + 3\sec x + c$

D. $3\tan x - 4\sec x + c$

Answer: A

Watch Video Solution

3. Evaluate: $\int \frac{e^2 - 1}{e^2 + 1} dx$.

A. $\log\left(1 + e^{-2x}\right) + c$

B. $\log\left(e^x - e^{-x}\right) + c$

C. $\log\left(e^x + e^{-x}\right) + c$

D.

Answer: D

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4. $\int \frac{dx}{\sin^2 x \cos^2 x}$ is equal to

A. $\tan x - \cot x + c$

B. $\sec x + \cos ecx + c$

C. $\sec x - \cos ecx + c$

D.

Answer: B

Watch Video Solution

5. $\int \frac{\sin x}{\sqrt{1+\cos x}} dx = ?$

A. $\sqrt{1+\cos x} + c$

B. $-2\sqrt{1+\cos x} + c$

C. $2\sqrt{1+\cos x} + c$

D. $2(1+\cos x) + c$

Answer: C

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6. The value of $\int \tan^3 2x \sec 2x \, dx$ is equal to:

A. $\frac{1}{2}\sec^3 2x + \frac{1}{2}\sec 2x + c$

B. $\frac{1}{6}\sec^3 2x - \frac{1}{2}\sec 2x + c$

C. $\frac{1}{6}\sec^3 2x + \frac{1}{2}\sec 2x + c$

D.

Answer: C

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7. Write a value of $\int e^x (\sin x + \cos x) dx$

A. $e^x \cos x + c$

B. $-e^x \sin x + c$

C. $-e^x \cos x + c$

D.

Answer: A

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8. $\int \cos(\log x)dx$ is equal to (A) $\frac{x}{2}(\cos(\log x) - \sin(\log x)) + c$ (B) $x(\cos(\log x) + \sin(\log x)) + c$ (C) $\frac{x}{2}(\cos(\log x) + \sin(\log x) + c$ (D) $x(\cos(\log x) - \sin(\log x)) + c$

A. $\frac{x}{2}[\sin(\log x) + \cos(\log x)] + c$

B. $\frac{x}{2}[\sin(\log x) - \cos(\log x)] + c$

C. None of the above

D.

Answer: B

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9. Evaluate: $\int \frac{\tan^{-1} x}{1+x^2} dx$

A. $\frac{1}{3}\left(\tan^{-1} x\right)^2 + c$

B. $\left(\tan^{-1} x\right)^2 + c$

C. $\left(\tan^{-1} x\right)^3 + c$

D.

Answer: A

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10. Evaluate $\int \frac{e^{m\tan^{-1} x}}{1+x^2} dx$

A. $\frac{1}{m} e^{m\tan^{-1} x} + c$

B. $e^{m\tan^{-1} x} + c$

C. None of these

D.

Answer: B

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11. Evaluate: $\int \frac{\sin(x-\alpha)}{\sin(x+\alpha)}\,dx$

A. $x\cos 2\alpha + \sin 2\alpha \log|\sin(x+\alpha)| + c$

B. $x\cos 2\alpha - \sin 2\alpha \log|\sin(x+\alpha)| + c$

C. None of the above

D.

Answer: C

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12. Evaluate the following integration

$$\int \sin^3 x \cos^3 x dx$$

A. $\frac{1}{4}\sin^4 x + \frac{1}{6}\sin^6 x + c$

B. $\frac{1}{4}\cos^4 x - \frac{1}{6}\cos^6 x + c$

C. none of the above

D.

Answer: A

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13. $\int \frac{x}{1+\cos x} dx = ?$

A. $x\tan\left(\frac{x}{2}\right)+2\log\cos\left(\frac{x}{2}\right)+c$

B. $x\tan\left(\frac{x}{2}\right)+2\log\sin\left(\frac{x}{2}\right)+c$

C. None of the above

D.

Answer: A

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14. $\int\frac{1-\cos x}{1+\cos x}dx=?$

A. $2\tan\left(\frac{x}{2}\right)+x+c$

B. $\tan\left(\frac{x}{2}\right)+x+c$

C. $\tan\left(\frac{x}{2}\right)+2x+c$

D. none of these

Answer: A

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15. $\int \frac{x^2}{x^2+4} dx = ?$

A. $x + 4\tan^{-1}\left(\frac{x}{2}\right) + c$

B. $x - 2\tan^{-1}\left(\frac{x}{2}\right) + c$

C. None of the above

D.

Answer: C

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16. $\int_{-2}^{2} X \sin^{10} x dx = ?$

A. -2

B. 4

C. None of the above

D.

Answer: D

Watch Video Solution

17. $\int_{-4}^{4} \log\left(\frac{7-x}{7+x}\right) dx = ?$

A. 4

B. -4

C. 0

D. 1

Answer: C

Watch Video Solution

18. Evaluate: $\int_2^8 |x-5|dx$

A. 9

B. 10

C. 11

D.

Answer: B

Watch Video Solution

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

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

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

C. $\frac{1}{(n+1)(n+3)}$

D.

Answer: B

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20. 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. None of these

D.

Answer: C

Watch Video Solution

21. $\int_0^1 \frac{x}{\sqrt{1+x^2}} dx$

A. $\sqrt{2} - 1$

B. $\sqrt{2}$

C. $-\sqrt{2}$

D.

Answer: B

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22. $\int_0^{\pi/2} x \sin x \cos x dx = ?$

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

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

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

D. none of these

Answer: B

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23. Evaluate $\int_0^{\pi/4} \log(1+\tan\theta)d\theta$

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

B. $\frac{\pi}{6}\log 2$

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

D.

Answer: D

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24. $\int_0^1 |5x-3|dx = ?$

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25. if $f(x) = \begin{cases} 3x + 4, & 0 \leq x \leq 2, \\ 5x & 2 \leq x \leq 3 \end{cases}$ then $\int_0^3 f(x)dx = ?$

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Exercise 7s

1.

if $\int(\sin 2x - \cos 2x)dx = \frac{1}{\sqrt{2}}\sin(2x - k) + c$ then $k = ?$

A. $-\frac{5\pi}{4}$

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

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

D.

Answer: B

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2. $\int \frac{1}{\sqrt{\sin^3 x \cos x}} dx = ?$

A. $-2\sqrt{\tan x} + c$

B. $\frac{2}{\sqrt{\tan x}} + c$

C. $\frac{-2}{\sqrt{\tan x}} + c$

D.

Answer: C

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3. The integral $\int \frac{dx}{x^2(x^4+1)^{3/4}}$ equals

A. $\left(1+x^4\right)^{1/4}+c$

B. $\left(1-x^{-4}\right)^{1/4}+c$

C. $-\left(1+x^{-4}\right)^{1/4}+c$

D.

Answer: D

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4. $\int[l+2\tan x(\tan x+\sec x)]^{1/2}dx$

A. $\log\{\cos ecx(\sec x+\tan x)\}+c$

B. $\log\{\sec x(\sec x+\tan x)\}+c$

C. None of the above

D.

Answer: C

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5. Evaluate: $\int \frac{1}{x\left(x^n+1\right)}\,dx$

A. $\frac{1}{n}\log\{x^n(x^n+1))\}+c$

B. $\log\left(\frac{x^n}{x^n+1}\right)\Big)+c$

C. None of the above

D.

Answer: A

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6. $\int \log(x^2 + a^2)dx = ?$

A. $x\log(x^2 + a^2) - 2x + 2a\tan^{-1}.\frac{x}{a} + c$

B. $x\log(x^2 + a^2) + 2x - 2a\tan^{-1}.\frac{x}{a} + c$

C. None of the above

D.

Answer: A

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7. $\int \frac{1 - \sin x}{1 - \cos x}dx = ?$

A. $\cot.\frac{x}{2} - 2\log\sin.\frac{x}{2} + c$

B. $-\cot.\frac{x}{2} - 2\log\sin.\frac{x}{2} + c$

C. None of the above

D.

Answer: C

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8. Evaluate: $\int \frac{(x-1)e^x}{(x+1)^3} dx$

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

B. $\frac{e^x}{(x+1)^3} + c$

C. $\frac{e^x}{(x+1)^4} + c$

D.

Answer: B

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9. Evaluate: $\int \frac{x^2}{(a+bx)^2} dx$

A. $\frac{-x^2}{b(a+bx)} + \frac{2}{b^2}\left[x - \frac{a}{b}\log(a+bx)\right] + c$

B. $\frac{-x^2}{b(a+bx)} - \frac{2}{b^2}\left[x - \frac{a}{b}\log(a+bx)\right] + c$

C. None of the above

D.

Answer: B

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10. $\int \frac{4x^2 + x + 1}{x^3 - 1} dx = ?$

A. $\log(x-1) - \log(x^3 - 1) + c$

B. $\log\left(x^3-1\right)+\log(x-1)+c$

C. None of the above

D.

Answer: C

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

A. 0

B. -1

C. none of these

D.

Answer: B

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12. $\int_0^{1/2} \frac{x \sin^{-1} x}{\sqrt{1-x^2}} dx = ?$

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

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

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

D. None of these

Answer: A

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13. $\int_0^{\pi/4} \sin x(x) = ?$

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14. Evaluate : $\int_0^1 \cot^{-1}\left(1-x+x^2\right)dx$

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

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

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

D.

Answer: C

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15. Evaluate the following integral:

$\int_0^{\pi/4}\left(\sqrt{tanx}+\sqrt{\cot x}\right)dx$

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

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

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

D.

Answer: A

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16. Using properties of definite integrals, evaluate:

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

A. 0

B. 1

C. None of the above

D.

Answer: B

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17. $\int_0^{\pi/2} 1/\text{cosec}\left(x - \frac{\pi}{3}\right)dx = ?$

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

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

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

C. None of the above

D.

Answer: B

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

A. $-\pi \log 2$

B. $\pi \log 2$

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

D.

Answer: B

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Exercise 7.1

1. $\int \sin 2x\, dx$

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2. $\int \cos 3x\, dx$

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3. $\int e^{2x}\, dx$

Watch Video Solution

4. $\int (ax+b)^2\, dx$

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5. $\int (\sin 2x - 4e^{3x})\, dx$

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6. $\int (4e^{3x} + 1)\, dx$

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7. $\int x^2 \left(1 - \frac{1}{x^2}\right) dx$

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

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9. $\int (2x^2 + e^x)\,dx$

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10. Find the integral $\int \left(\sqrt{x} - \frac{1}{\sqrt{x}}\right)^2 dx$

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11. Find the integral $\int \frac{x^3 + 5x^2 - 4}{x^2} dx$

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12. Evaluate the following integrals.

$$\int \frac{x^3 + 3x^2 + 4}{\sqrt{x}} dx$$

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13. Find the integral $\int \frac{x^3 - x^2 + x - 1}{x - 1} dx$

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14. Find the integral $\int (1 - x)\sqrt{x} dx$

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15. Find the integral $\int \sqrt{x}\left(3x^2 + 2x + 3\right) dx$

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16. Find the integral $\int (2x - 3\cos x + e^x)\,dx$

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17. Find the integral $\int \left(2x^2 - 3\sin x + 5\sqrt{x}\right)dx$

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18. Find the integral $\int \sec x(\sec x + \tan x)\,dx$

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19. Evaluate: $\int \frac{\sec^2 x}{\cos ec^2 x} dx$

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20. $\int \frac{2 - 3\sin x}{\cos^2 x} dx$

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21. The anti derivative of $\left(\sqrt{x} + \frac{1}{\sqrt{x}}\right)$ equals(A) $\frac{1}{3}x^{\frac{1}{3}} + 2x^{\frac{1}{2}} + C$ (B) $\frac{2}{3}x^{\frac{2}{3}} + \frac{1}{2}x^2 + C$(C) $\frac{2}{3}x^{\frac{3}{2}} + 2x^{\frac{1}{2}} + C$ (D) $\frac{3}{2}x^{\frac{3}{2}} + \frac{1}{2}x^{\frac{1}{2}} + C$

A. $\frac{2}{3}x^{\frac{2}{3}} + \frac{1}{2}x^2 + c$

B. $\frac{2}{3}x^{\frac{3}{2}} + 2x^{\frac{1}{2}} + c$

C. $\frac{3}{2}x^{\frac{3}{2}} + \frac{1}{2}x^{\frac{1}{2}} + c$

D.

Answer: c

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22. If $\frac{d}{dx}f(x) = 4x^3 - \frac{3}{x^4}$ such that $f(2) = 0$. Then f(x) is(A) $x^4 + \frac{1}{x^3} - \frac{129}{8}$ (B) $x^3 + \frac{1}{x^4} + \frac{129}{8}$(C) $x^4 + \frac{1}{x^3} + \frac{129}{8}$ (D) $x^3 + \frac{1}{x^4} - \frac{129}{8}$

A. $x^3 + \frac{1}{x^4} + \frac{129}{8}$

B. $x^4 + \frac{1}{x^3} - \frac{129}{8}$

C. $x^3 + \frac{1}{x^4} + \frac{129}{8}$

D. None Of These

Answer: B

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Exercise 7.2

1. $\int \frac{2x}{1+x^2}$

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

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3. $\frac{1}{x + x \log x}$

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4. $\sin x \sin(\cos x)$

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5. $\sin(ax+b)\cos(ax+b)$

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6. $\sqrt{ax+b}$

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7. $x\sqrt{x+2}$

Watch Video Solution

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

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9. Integrate the functions $(4x+2)\sqrt{x^2+x+1}$

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10. Integrate the functions $\frac{1}{x-\sqrt{x}}$

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11. Integrate the functions $\frac{x}{\sqrt{x+4}}, x>0$

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12. Integrate the functions $\left(x^3-1\right)^{\frac{1}{3}} x^5$

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13. Integrate the functions $\frac{x^2}{\left(2+3x^3\right)^3}$

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14. Integrate the functions $\frac{1}{x(\log x)^m}, x>0$

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15. Integrate the functions $\frac{x}{9-4x^2}$

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16. e^{2x+3}

Watch Video Solution

17. $\frac{x}{e^{x^2}}$

Watch Video Solution

18. Integrate the functions $\frac{e^{\tan\hat{}(-1)x}}{1+x^2}$

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19. Integrate the functions $\frac{e^{2x}-1}{e^{2x}+1}$

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20. Integrate the functions $\frac{e^{2x} - e^{-2x}}{e^{2x} + e^{-2x}}$

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21. Integrate the functions $\tan^2(2x - 3)$

Watch Video Solution

22. Evaluate: $\int \sec^2(7 - 4x)\, dx$

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23. $\frac{\sin^{-1} x}{\sqrt{1 - x^2}}$

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24. $\frac{2\cos x - 3\sin x}{6\cos x + 4\sin x}$

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25. Integrate the functions $\frac{1}{\cos^2 x(1-\tan x)^2}$

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26. Integrate the functions $\frac{\cos\sqrt{x}}{\sqrt{x}}$

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27. $\sqrt{\sin 2x}\cos 2x$

Watch Video Solution

28. $\frac{\cos x}{\sqrt{1+\sin x}}$

Watch Video Solution

29. Integrate the functions$\cot x \log \sin x$

Watch Video Solution

30. $\frac{\sin x}{1+\cos x}$

Watch Video Solution

31. Integrate the functions $\frac{\sin x}{(1+\cos x)^2}$

Watch Video Solution

32. Integrate the functions $\frac{1}{1+\cot x}$

Watch Video Solution

33. $\frac{1}{1-\tan x}$

Watch Video Solution

34. Integrate the functions $\frac{\sqrt{\tan x}}{\sin x \cos x}$

Watch Video Solution

35. $\frac{(1+\log x)^2}{x}$

Watch Video Solution

36. Integrate the functions $\frac{(1+x)(x+\log x)^2}{x}$

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37. $\frac{x^3 \sin\left(\tan^{-1} x^4\right)}{1+x^8}$

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38. $\int \frac{10x^9 + 10x^x (\log)_{e^{10}} dx}{x^{10} + 10^x}$ equals(A) $10^x - x^{10} + C$ (B) $10^x + x^{10} + C$(C) $\left(10^x - x^{10}\right)^{-1} + C$ (D) $\log\left(10^x + x^{10}\right) + C$

A. $10^x - x^{10} + c$

B. $10^x + x^{10} + c$

C. $\left(10^x - x^{10}\right)^{-1} + c$

D. $\log\left(10^x + x^{10}\right) + c$

Answer: D

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39. $\int \frac{dx}{\sin^2 x \cos^2 x}$ is equal to

A. $\tan x - \cot x + c$

B. $\tan x \cot x + c$

C. $\tan x - \cot 2x + c$

D.

Answer: b

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Exercise 7.3

1. Find the integrals of the functions$\sin^2(2x + 5)$

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2. Integrate the functions $\sin 3x \cos 4x$

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3. Integrate the functions $\cos 2x \cos 4x \cos 6x$

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4. Find the integrals of the functions $s \in^3 (2x + 1)$

Watch Video Solution

5. Integrate the functions$\sin^3 x \cos^3 x$

Watch Video Solution

6. $\sin x \sin 2x \sin 3x$

Watch Video Solution

7. $\sin 4x \sin 8x$

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8. Integrate the functions $\frac{1-\cos x}{1+\cos x}$

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9. $\int \frac{\cos x}{1+\cos x}\, dx$

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10. Integrate the functions $\sin^4 x$

Watch Video Solution

11. Integrate the functions $\cos^4 2x$

Watch Video Solution

12. Integrate the functions $\frac{\sin^2 x}{1+\cos x}$

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13. Evaluate: $\int \frac{\cos 2x - \cos 2\alpha}{\cos x - \cos \alpha} dx$

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14. Integrate the functions $\frac{\cos x - \sin x}{1 + \sin 2x}$

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15. Integrate the functions $\tan^3 2x \sec 2x$

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16. Integrate the functions $\tan^4 x$

Watch Video Solution

17. Integrate the functions $\frac{\sin^3 x + \cos^3 x}{\sin^2 x \cos^2 x}$

Watch Video Solution

18. Integrate the functions $\frac{\cos 2x + 2\sin^2 x}{\cos^2 x}$

Watch Video Solution

19. Integrate the functions $\frac{1}{\sin x \cos^3 x}$

Watch Video Solution

20. Integrate the functions $\frac{\cos 2x}{(\cos x + \sin x)^2}$

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21. Integrate the functions$\sin^{-1}(\cos x)$

Watch Video Solution

22. Evaluate

$$\int \frac{1}{\cos(x-a)\cos(x-b)} dx$$

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23. Integrate the functions $\frac{1}{\cos(x-a)\cos(x-b)}$ dx

A. $\tan x + \cos ecx + c$

B. $-\tan x + \cot x + c$

C. $\tan x + \sec x + c$

D.

Answer: a

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24. $\int\left(e^{x}\frac{1+x}{\cos^{2}(e^{\times})dx}\right.$ equals (A) $-\cot(ex^{x})+C$ (B) $\tan(xe^{x})+C$ (C) $\tan(e^{x})+C$ (D) $\cot(e^{x})+C$

A. $\tan(xe^{x})+c$

B. $\tan(e^{x})+c$

C. $\cot(e^{x})+c$

D.

Answer: b

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Exercise 7.4

1. Integrate : $\frac{3x^2}{x^6+1}$

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2. Integrate the functions $\frac{1}{\sqrt{1+4x^2}}$

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

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4. Integrate the functions $\frac{1}{\sqrt{9-25x^2}}$

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5. Integrate the functions $\frac{3x}{1+2x^4}$

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6. $\int \frac{x^2}{1+x^6}$

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7. Integrate the functions $\frac{x-1}{\sqrt{x^2-1}}$

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8. Integrate the functions $\frac{x^2}{\sqrt{x^6+a^6}}$

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9. Integrate the functions $\frac{\sec^2 x}{\sqrt{\tan^2 x + 4}}$

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10. Integrate the functions $\frac{1}{\sqrt{x^2 + 2x + 2}}$

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11. Integrate the functions $\frac{1}{9x^2 + 6x + 5}$

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12. Integrate the functions $\frac{1}{\sqrt{7 - 6x - x^2}}$

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13. Integrate the functions $\frac{1}{\sqrt{(x-1)(x-2)}}$

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14. Integrate the functions $\frac{1}{\sqrt{8+3x-x^2}}$

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15. Integrate the functions $\frac{1}{\sqrt{(x-a)(x-b)}}$

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16. Integrate the functions $\frac{4x+1}{\sqrt{2x^2+x-3}}$

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17. Integrate the functions $\frac{x+2}{\sqrt{x^2-1}}$

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18. Integrate the functions $\frac{5x-2}{1+2x+3x^2}$

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19. Evaluate : $\int \frac{6x+7}{\sqrt{(x-5)(x-4)}}\,dx$

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20. Integrate the functions $\frac{x+2}{\sqrt{4x-x^2}}$

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21. Integrate the functions $\frac{x+2}{\sqrt{x^2+2x}+3}$

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22. Integrate the functions $\frac{x+3}{x^2-2x-5}$

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23. Evaluate: $\int \frac{5x+3}{\sqrt{x^2+4x+10}}\,dx$

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24. $\int \frac{dx}{x^2+2x+2}$ equals(A) $x\tan^{-1}(x+1)+C$ (B) $\tan^{-1}(x+1)+C$(C) $(x+1)\tan^{-1}x+C$ (D) $\tan^{-1}x+C$

A. $\tan^{-1}(x+1)+C$

B. $(x+1)\tan^{-1}x+C$

C. $\tan^{-1}x+C$

D.

Answer: b

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25. $\int \frac{dx}{\sqrt{9x-4x^2}}$ equals(A) $\frac{1}{9}\sin^{-1}\left(\frac{9x-8}{8}\right)+C$ (B) $\frac{1}{2}\sin^{-1}\left(\frac{8x-9}{9}\right)+C$(C) $\frac{1}{3}\sin^{-1}\left(\frac{9x-8}{8}\right)+C$ (D)

$$\frac{1}{2}\sin^{-1}\left(\frac{9x-8}{9}\right)+C$$

A. $\frac{1}{2}\sin^{-1}\left(\frac{8x-9}{9}\right)+C$

B. $\frac{1}{3}\sin^{-1}\left(\frac{9x-8}{8}\right)+C$

C. $\frac{1}{2}\sin^{-1}\left(\frac{9x-8}{9}\right)+C$

D.

Answer: b

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Exercise 7.5

1. Integrate the rational functions $\frac{x}{(x+1)(x+2)}$

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2. $\int \frac{1}{x^2 - 9} dx$

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3. $\int \frac{3x - 1}{(x - 1)(x - 2)(x - 3)} dx$

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4. $\int \frac{x}{(x - 1)(x - 2)(x - 3)} dx$

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5. Evaluate: $\int \frac{2x + 3}{x^2 + 3x + 2}$

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6. Integrate $\frac{1-x^2}{x(1-2x)}$

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7. Integrate the rational functions $\frac{x}{(x^2+1)(x-1)}$

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8. Evaluate : $\int \frac{x}{(x-1)^2(x+2)} dx.$

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9. Evaluate: $\int \frac{3x+5}{x^3-x^2-x+1} dx$

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10. Evaluate: $\int \frac{2x-3}{(x^2-1)(2x+3)}\,dx$

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11. Integrate the rational functions $\frac{x}{(x+1)(x+2)}$

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

Watch Video Solution

13. $\frac{2}{(1-x)(1+x^2)}$

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

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15. Integrate the rational functions $\frac{1}{x^4-1}$

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16. Integrate the rational functions $\frac{1}{x(x^n+1)}$ [Hint: multiply numerator and denominator by x^{n-1} and put $x^n = t$]

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17. Integrate the rational functions $\frac{\cos x}{(1-\sin x)(2-\sin x)}$

[Hint: Put $s \in \quad x \quad = \quad t$]

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18. Evaluate: $\int \frac{\left(x^2+1\right)\left(x^2+4\right)}{\left(x^2+3\right)\left(x^2-5\right)} dx$

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19. Evaluate: $\int \frac{2x}{\left(x^2+1\right)\left(x^2+3\right)} dx$

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20. Evaluate: $\int \frac{1}{x\left(x^4-1\right)} dx$

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21. $\frac{1}{(e^x - 1)}$

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22. $\int \frac{xdx}{(x-1)(x-2)}$ equals :

A. $\log\left|\frac{(x-2)^2}{x-1}\right| + C$

B. $\log\left|\left(\frac{x-1}{x-2}\right)^2\right| + C$

C. $\log\left|\left(\frac{x-1}{x+2}\right)^2\right| + C$

D.

Answer: A

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23. $\int \frac{dx}{x(x^2+1)}$ equals

A. $\log|x| + \frac{1}{2}\log(x^2+1) + C$

B. $-\log|x| + \frac{1}{2}\log(x^2+1) + C$

C. $\frac{1}{2}\log|x| + \log(x^2+1) + c$

D.

Answer: A

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Exercise 7.6

1. $x \sin x$

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2. Evaluate $\int x \sin 3x dx.$

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3. $x^2 e^x$

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4. $x \log x$

Watch Video Solution

5. $x \log 2x$

Watch Video Solution

6. $x^2 \log x$

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7. $\int x \sin^{-1} x dx$

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8. $x \tan^{-1} x$

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9. ∫x cos^(-1)x`

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10. Evaluate: $\int \left(\sin^{-1} x\right)^2 dx$

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11. Evaluate: $\int \frac{x \cos^{-1} x}{\sqrt{1-x^2}} dx$

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12. Integrate the functions$x \sec^2 x$

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13. Evaluate $\int \tan^{-1} x dx$

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14. Evaluate the following Integrals.

$\int x(\log x)^2 dx$

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15. *Evaluate*: $\int (x^2+1)\log \mathrm{x}\ \mathrm{dx}$

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16. Write a value of $\int e^x (\sin x + \cos x) dx$

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17. Evaluate: $\int \frac{e^{\times}}{(x+1)^2} dx$

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18. Evaluate: $\int e^x \left(\frac{1+\sin x}{1+\cos x} \right) dx$

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19. Integrate the functions $e^x \left(\frac{1}{x} - \frac{1}{x^2} \right)$

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20. Evaluate: $\int \frac{(x-1)e^x}{(x+1)^3} dx$

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21. Integrate the functions$e^{2x} \sin x$

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22. Evaluate the integrals $\int 01 \sin^{-1}\left(\frac{2x}{1+x^2}\right) dx$

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23. Choose the correct answer $\int x^2 e^x \hat{} 3 dx$ equals (A) $\frac{1}{3} e^x \hat{} 3 + C$ (B) $\frac{1}{3} e^x \hat{} 2 + C$ (C) $\frac{1}{2} e^x \hat{} 3 + C$ (D)

$\frac{1}{2}e^{x}\ \hat{}\ 2+C$

A. $\frac{1}{3}e^{x^2}+C$

B. $\frac{1}{2}e^{x^3}+C$

C. $\frac{1}{2}e^{x^2}+C$

D.

Answer: a

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24. Evaluate: $\int e^{x}\sec x\left(1+\tan x\right)dx$

A. $e^{x}\sec x+C$

B. $e^{x}\sin x+C$

C. $e^{x}\tan x+C$

D.

Answer: b

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Exercise 7.7

1. Integrate the functions $\sqrt{4-x^2}$

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2. Integrate the functions $\sqrt{1-4x^2}$

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3. Integrate the functions $\sqrt{x^2+4x+6}$

Watch Video Solution

4. Integrate the functions $\sqrt{x^2+4x+6}$

Watch Video Solution

5. Integrate the functions $\sqrt{1-4x-x^2}$

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6. Integrate the functions $\sqrt{x^2+4x-5}$

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7. Evaluate: $\int \sqrt{1+3x-x^2}dx$

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8. Integrate the functions $\sqrt{x^2+3x}$

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9. Integrate the functions $\sqrt{1+\frac{x^2}{9}}$

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10. Choose the correct answer $\int \sqrt{a+x^2}dx$ is equal to (A) $\frac{x}{2}\sqrt{1+x^2}+\frac{1}{2}\log\left|\left(x+\sqrt{x+x^2}\right)\right|+C$ (B)

$\frac{2}{3}(1+x^2)^{\frac{3}{2}}+C$ (C) $\frac{2}{3}x(1+x^2)^{\frac{3}{2}}+C$ (D) $\frac{x^2}{2}\sqrt{1+x^2}+\frac{1}{2}x^2\log\left|x+\sqrt{1+x^2}\right|+C$

A. $\frac{2}{3}(1+x^2)^{\frac{3}{2}}+C$

B. $\frac{2}{3}x(1+x^2)^{\frac{3}{2}}+C$

C. $\frac{x^2}{2}\sqrt{1+x^2}+\frac{1}{2}x^2\log\left|x+\sqrt{1+x^2}\right|+C$

D.

Answer: A

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11. Choose the correct answer $\int\sqrt{x^2-8x+7}dx$ (A) $\frac{1}{2}(x-4)\sqrt{x^2-8x+7}+9\log\left|x-4+\sqrt{x^2-8x+7}\right|+C$

(B)

$\frac{1}{2}(x+4)\sqrt{x^2-8x+7}+9\log\left|x+4+\sqrt{x^2-8x+7}\right|+C$

(C)

$$\frac{1}{2}(x-4)\sqrt{x^2-8x+7}-3\sqrt{2}\log\left|x-4+\sqrt{x^2-8x+7}\right|+C$$

(D) `1/2(x-4)sqrt(x^2-8x+7)-

A. $\frac{1}{2}(x+4)\sqrt{x^2-8x+7}$

$+9\log\mid x+4+\sqrt{x^2-8x+7}\mid+C$

B. $\frac{1}{2}(x-4)\sqrt{x^2-8x+7}$

$-3\sqrt{2}\log\mid x-4+\sqrt{x^2-8x+7}\mid+C$

C. $\frac{1}{2}(x-4)\sqrt{x^2-8x+7}$

$-\frac{9}{2}\log\mid x-4+\sqrt{x^2-8x+7}\mid+C$

D.

Answer: D

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Exercise 7.8

1. $\int_a^b x dx$

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

$\int_0^5 (x+1) dx$

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3. $\int_2^3 x^2 dx$

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4. Evaluate the following integrals as limit of sum:

$$\int_1^4 (x^2 - x)\,dx$$

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5. Evaluate : $\int_{-1}^{1} e^x\,dx$.

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

$$\int 04(x + e^{2x})\,dx$$

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Exercise 7.9

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

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2. Evaluate: $\int_{2}^{3}\frac{1}{x}\,dx$

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3. Evaluate the definite integrals $\int 12\left(4x^3-5x^2+6x+9\right)dx$

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4. $\int_{0}^{\frac{\pi}{4}}\sin 2x\,dx$

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5. $\int_0^{\frac{\pi}{2}} \cos 2x dx$

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6. Evaluate the definite integrals $\int_4^5 e^x dx$

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7. Evaluate the definite integrals $\int 0 \frac{\pi}{4} \tan x dx$

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8. Evaluate the definite integrals $\int \frac{\pi}{6} \frac{\pi}{4} \cos ecx dx$

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9. Evaluate the definite integrals $\int 01 \frac{dx}{\sqrt{1-x^2}}$

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

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11. Evaluate the definite integrals $\int 23 \frac{dx}{x^2-1}$

Watch Video Solution

12. $\int_0^{\pi/4} \cos^2 x dx$

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13. $\int_2^3 \frac{xdx}{x^2+1}$

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14. Evaluate $\int_0^1 \frac{2x+3}{5x^2+1}dx$

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15. $\int_0^1 xe^{x^2}dx$

Watch Video Solution

16. Evaluate : $\int_1^2 \frac{5x^2}{x^2+4x+3}dx$

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17. Evaluate the definite integrals $\int 0\frac{\pi}{4}\left(2\sec^2 x + x^3 + 2\right)dx$

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18. Evaluate the definite integrals $\int_0^{\pi}\left(\sin^2\left(\frac{x}{2}\right) - \cos^2\left(\frac{x}{2}\right)\right)dx$

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19. Evaluate the definite integrals $\int_0^2 \frac{6x+3}{x^2+4}dx$

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

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21. 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) $\frac{\pi}{12}$

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

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

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

D.

Answer: d

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22. Choose the correct answer $\int_0^{\frac{2}{3}} \frac{dx}{4+9x^2}$ (A) $\frac{\pi}{6}$ (B) $\frac{\pi}{12}$ (C) $\frac{\pi}{24}$ (D) $\frac{\pi}{4}$

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

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

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

D.

Answer: c

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Exercise 7.10

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

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2. Evaluate the integrals $\int 0 \frac{\pi}{2} \sqrt{\sin \varphi} \cos^5 \varphi d\varphi$

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3. Evaluate the integrals $\int 01 \sin^{-1}\left(\frac{2x}{1+x^2}\right) dx$

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4. $\int_0^2 x\sqrt{x+2} dx \quad (\text{put x+2} \quad = t^2)$

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

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6. Evaluate the integrals $\int 02 \frac{dx}{x+4-x^2}$

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7. Evaluate the integrals $\int_{-1}^{1} \frac{1}{x^2+2x+5} dx$

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8. Evaluate the following definite integral:

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

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

A. 0

B. 3

C. 4

D.

Answer: a

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10. If $f(x) = \int_0^x \text{t sin t dt tehn } f(x) is$

A. x sin x

B. x cos x

C. sin x+x cos x

D.

Answer: b

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Exercise 7.11

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

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

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

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4. $\int_0^{\frac{\pi}{2}} \frac{\cos^5 x dx}{\sin^5 x + \cos^5 x}$

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5. $\int_{-5}^{5} |x+2| dx$

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6. $\int_2^8 |x-5|dx$

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7. Find the value of $\int_0^1 x(1-x)^n dx$.

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

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9. $\int_0^2 x\sqrt{2-x}dx$

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

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11. Evaluate : $\int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} \sin^2 x dx$

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12. $\int_0^{\pi} \frac{x}{1+\sin x}dx.$

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13. $\int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} \sin^7 x dx$

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

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15. By using the properties of definite integrals, evaluate the integrals $\int 0 \frac{\pi}{2} \frac{\sin x - \cos x}{1 + \sin x \cos x} dx$

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

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17. By using the properties of definite integrals, evaluate the integrals $\int 0a \frac{\sqrt{x}}{\sqrt{x}+\sqrt{a-x}}dx$

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18. $\int_0^4 |x-1|dx$

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19. Show that $\int 0af(x)g(x)dx = 2\int 0af(x)dx$ if f and g defined as $f(x) = f(a-x)$ and

$g(x) \quad + g(a - x) = \quad 4$

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20. 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) p (D) 1

A. 2

B. PI

C. 1

D.

Answer: C

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21. Evaluate $\int_0^{\frac{\pi}{2}} \log\left(\frac{4+3\sin x}{4+3\cos x}\right) dx$

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

B. 0

C. -2

D.

Answer: C

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Miscellaneous Exercise

1. Integrate the functions $\frac{1}{x - x^3}$

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2. Evaluate: $\int \frac{1}{\sqrt{x+a}+\sqrt{x+b}}\,dx$

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3. $\frac{1}{x\sqrt{ax-x^2}}$ $[\text{Hint : Put x} \quad = \frac{a}{t}]$

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5. Evaluate: $\int \frac{1}{x^{1/2}+x^{1/3}}\,dx$

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6. Integrate the functions $\frac{5x}{(x+1)(x^2+9)}$

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7. $\int \frac{\sin x}{\sin(x-\alpha)} dx = Ax + B\log(\sin(x-\alpha)) + C$ then find out (A, B)

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8. $\int \frac{e^{5\log x} - e^{4\log x}}{e^{3\log x} - e^{2\log x}} dx$

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9. $\frac{\cos x}{\sqrt{4-\sin^2 x}}$

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10. $I = \int \frac{\sin^8 x - \cos^8 x}{1 - 2sij^2 x \cos^2 x} dx$ is equal to:

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11. Integrate the functions $\frac{1}{\cos(x-a)\cos(x-b)}$ dx

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12. $\frac{x^3}{\sqrt{1-x^8}}$

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13. $\int \frac{e^x}{(1+e^x)(2+e^x)} dx$

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14. Evaluate: $\int \frac{1}{(x^2+1)(x^2+4)} dx$

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15. $\cos^3 x e^{\log \sin x}$

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16. Evaluate: $\int e^{3\log x} \left(x^4+1\right)^{-1} dx$

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17. Integrate the functions $f'(ax+b)[f(ax+b)]^n$

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18. Integrate the functions $\frac{1}{\sqrt{\sin^3 x \sin(x+\alpha)}}$

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19. Find : $\int \frac{\sin^{-1}\sqrt{x} - \cos^{-1}\sqrt{x}}{\sin^{-1}\sqrt{x} + \cos^{-1}\sqrt{x}} dx, x \in [0, 1]$

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20. Integrate the functions $\sqrt{\frac{1-\sqrt{x}}{1+\sqrt{x}}}$

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21. $\frac{2+\sin 2x}{1+\cos 2x}e^{x}$

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22. Integrate the functions $\frac{x^2+x+1}{(x+1)^2(x+2)}$

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23. Evaluate: $\int \tan^{-1}\sqrt{\frac{1-x}{1+x}}dx$

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24. Integrate the functions $\frac{\sqrt{x^2+1}\left[\log\left(x^2+1\right)-2\log x\right]}{x^4}$

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25. Evaluate the definite integrals $\int_{\frac{\pi}{2}}^{\pi} e^x\left(\frac{1-\sin x}{1-\cos x}\right)dx$

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

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

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28. $\int_{\frac{\pi}{6}}^{\frac{\pi}{3}} \frac{\sin x + \cos x}{\sqrt{\sin 2x}} dx$

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29. $\int_{0}^{1} \frac{1}{\sqrt{1+x} - \sqrt{x}} dx$

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30. $\int_{0}^{\frac{\pi}{4}} \frac{\sin x + \cos x}{9 + 16 \sin 2x} dx$

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31. $\int_0^{\frac{\pi}{2}} \sin 2x \tan^{-1}(\sin x) dx$

Watch Video Solution

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

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33. Evaluate the definite integrals

$\int 14[x-1| + |x-2| + |x-3 \mid]dx$

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34. $\int_1^3 \frac{dx}{x^2(x+1)} = \frac{2}{3} + \log. \frac{2}{3}$

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35. $\int_0^1 xe^x dx = 1$

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36. $\int_{-1}^1 x^{17} \cos^4 x dx = 0$

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37. Prove that $\int_0^{\frac{\pi}{2}} \sin^3 x dx = \frac{2}{3}$

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38. $\int_0^{\frac{\pi}{4}} 2\tan^3 x dx = 1 - \log 2$

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

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40. Evaluate $\int 01 e^{2-3x} dx$ as a limit of a sum.

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41. $\int \frac{dx}{e^x + e^{-x}}$ is equal to

A. $\tan^{-1}(e^x) + C$

B. $\log\left(e^{x}-e^{-x}\right)+C$

C. $\log\left(e^{x}+e^{-x}\right)+C$

D. $\tan^{-1}\left(e^{2x}\right)+C$

Answer: A

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42. $\int \frac{\cos 2x}{(\sin x+\cos x)^{2}}dx$ is equal to :

A. $\log|\sin x+\cos x|+C$

B. $\log|\sin x-\cos x|+C$

C. $\frac{1}{(\sin x+\cos x)^{2}}$

D.

Answer: b

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43. If $\left|\int_a^b f(x)dx\right| = \int_a^b |f(x)|dx, a < b,$ then $f(x) = 0$ has

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

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

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

D.

Answer: N/A

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

a. 1

b. -1

c. 0

d. $\pi/4$

A. 0

B. -1

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

D.

Answer: N/A

Watch Video Solution