MATHS

BOOKS - KUMAR PRAKASHAN KENDRA MATHS (GUJRATI ENGLISH)

INTEGRALS

Practice Work

1. Find the following integrals

$$\int \frac{2x^6 - x^5 + 4x^3 - 5x^2 + 6}{x^4} dx$$

2. Find the following integrals

$$\int (1+x)(3-2x)(4+5x)\,dx$$

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3. Find the following integrals

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

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4. Find the following integrals

$$\int \sqrt{x^3}\,dx$$

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5. Find the following integrals

$\int e^{3\log x}dx$

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6. Find the following integrals

$\int 5^x dx$

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7. Find the following integrals

$\int \left(x^3 + a^x + e^x a^x + \sin 2\right)dx$

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8. Find the following integrals

$$\int 3\mathrm{cosec}^2 x - 5x + \sin x dx$$

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9. Find the following integrals

$$\int \left(x^2 + \frac{1}{x^2}\right)^3 dx$$

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10. Find the following integrals

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

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11. Find the following integrals

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

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12. Find the following integrals

$$\int\left(e^{x\log a} + e^{a\log x} + e^{a\log a}\right)dx$$

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13. Find the following integrals

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

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14. Find the following integrals

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

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15. Find the following integrals

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

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16. Find the following integrals

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

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17. Find the following integrals

$$\int \left(\frac{2 + 3\cos x}{\sin^2 x} \right) dx$$

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18. Find the following integrals

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

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19. Find the following integrals

$$\int |x| dx$$

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20. Find the following integrals

$$\int\left(\sqrt{x} - \frac{\cos^2 x}{2}\right)dx$$

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21. If $f'(x) = 1 - \frac{4}{x^2}$ and f(1)=6 then find f(x) and f(2).

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22. If $f'(x) = \sec^2 x + \operatorname{cosec}^2 x - 1$ and $f\left(\frac{\pi}{4}\right) = 1$

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23. If $f'(x) = 3x^2 - \frac{2}{x^3}$ and f(1)=0 then find f(x).

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24. If $f'(x) = \sqrt{x}$ and f(1)=2 then find f(x).

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25. If $f'(x) = x - \frac{1}{x^2}$ and $f(1) = \frac{1}{2}$ then find f(x).

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26. Integrate the following functions :

$$\int \frac{x^3}{1 + x^8} dx$$

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27. Integrate the following functions :

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

Watch Video Solution

28. Integrate the following functions :

$$\int x(4+x)^{\frac{1}{4}}dx$$

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29. Integrate the following functions :

$$\int \frac{2x+5}{x^2+5x+9}dx$$

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30. Integrate the following functions :

$$\int \left(a^x + a^{-x}\right)^3 dx$$

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31. Integrate the following functions :

$$\int \frac{dx}{x\left(x^5 + 1\right)}$$

Watch Video Solution

32. Integrate the following functions :

$$\int (x - 2)\sqrt{x^2 - 4x + 7}dx$$

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33. Integrate the following functions :

$$\int \frac{dx}{1 + \sqrt{x}}$$

Watch Video Solution

34. Integrate the following functions :

$$\int \frac{x^3}{\left(1+x^2\right)^2} dx$$

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35. Integrate the following functions :

$$\int x^3 \cos x^4 dx$$

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36. Integrate the following functions :

$$\int \sin 2x . e^{\cos^2 x} dx$$

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37. Integrate the following functions :

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

Watch Video Solution

38. Integrate the following functions :

$$\int \frac{dx}{1+e^x}$$

Watch Video Solution

39. Integrate the following functions :

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

Watch Video Solution

40. Integrate the following functions :

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

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41. Integrate the following functions :

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

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42. Integrate the following functions :

$$\int \frac{\sin\left(\sqrt{x}\right)}{\sqrt{x}}dx$$

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43. Integrate the following functions :

$$\int \frac{1 + \tan x}{x + \log \sec x} dx$$

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44. Integrate the following functions :

$$\int \sqrt{\tan x}\left(1 + \tan^2 x\right) dx$$

Watch Video Solution

45. Integrate the following functions :

$$\int \frac{x - 1}{\sqrt{x + 4}} dx$$

Watch Video Solution

46. Integrate the following functions :

$$\int \frac{3x^2}{1+x^6}dx$$

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47. Integrate the following functions :

$$\int \frac{4x+3}{\sqrt{2x^2+3x+1}}dx$$

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48. Integrate the following functions :

$$\int \operatorname{cosec} x.\ \log(\operatorname{cos} sex - \cot x)dx$$

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49. Integrate the following functions :

$$\int \frac{\tan x}{\sec x + \cos x} dx$$

Watch Video Solution

50. Integrate the following functions :

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

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51. Integrate the following functions :

$$\int \frac{dx}{x\cos^2(1 + \log x)}$$

Watch Video Solution

52. Integrate the following functions :

$$\int \frac{\sec x.\ \operatorname{cosec} x}{\log(\cot x)}dx$$

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53. Integrate the following functions :

$$\int \frac{dx}{\sqrt{1 - (4x + 5)^2}}$$

Watch Video Solution

54. Integrate the following functions :

$$\int \frac{\sin x}{\sqrt{(3 + 4\cos x)^2}}dx$$

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55. Integrate the following functions :

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

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56. Find the integrals of the following functions :

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

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57. Find the integrals of the following functions :

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

Watch Video Solution

58. Find the integrals of the following functions :

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

Watch Video Solution

59. Find the integrals of the following functions :

$$\int \tan^{-1}(\sec x+\tan x)dx$$

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60. Find the integrals of the following functions :

$$\int \frac{\sin^6 x+\cos^6 x}{\sin^2 x\cos^2 x}dx$$

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61. Find the integrals of the following functions :

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

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62. Find the integrals of the following functions :

$\int \sec x dx$

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63. Find the integrals of the following functions :

$\int \cot x dx$

Watch Video Solution

64. Find the integrals of the following functions :

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

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65. Find the integrals of the following functions :

$$\int \sin^4 \theta \cos^3 \theta d\theta$$

Watch Video Solution

66. Find the integrals of the following functions :

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

Watch Video Solution

67. Find the integrals of the following functions :

$$\int \frac{\sin 6x}{\sin 10x \sin 4x} dx$$

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68. Find the integrals of the following functions :

$$\int \cos^5 x dx$$

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69. Find the integrals of the following functions :

$$\int \cos^{-1}(\sin x) dx$$

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70. Find the integrals of the following functions :

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

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71. Find the integrals of the following functions :

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

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72. Find the integrals of the following functions :

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

Watch Video Solution

73. Find the integrals of the following functions :

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

Watch Video Solution

74. Find the integrals of the following functions :

$$\int \left(x^{\frac{3}{2}} - \sin\frac{x}{2}\cos\frac{x}{2} + 1\right)dx$$

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75. Find the integrals of the following functions :

$$\int \frac{4 - 5\cos x}{\sin^2 x}$$

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76. Integrate the following function :

$$\int \frac{dx}{9x^2 - 7}$$

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77. Integrate the following function :

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

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78. Integrate the following function :

$$\int \frac{3x^2}{\sqrt{9 - x^6}} dx$$

Watch Video Solution

79. Integrate the following function :

$$\int \frac{e^x}{\sqrt{4 - e^{2x}}} dx$$

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80. Integrate the following function :

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

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81. Integrate the following function :

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

Watch Video Solution

82. Integrate the following function :

$$\int \frac{\operatorname{cosec}^2 x}{1 - \cot^2 x} dx$$

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83. Integrate the following function :

$$\int \frac{\sin\theta}{1 - 4\cos^2\theta} d\theta$$

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84. Integrate the following function :

$$\int \frac{x}{\sqrt{16x^4 + 9}} dx$$

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85. Integrate the following function :

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

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86. Integrate the following function :

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

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87. Integrate the following function :

$$\int \frac{dx}{7x^2 + 2x + 10}$$

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88. Integrate the following function :

$$\int \frac{dx}{\sqrt{(x+5)(x-1)}}$$

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89. Integrate the following function :

$$\int \frac{dx}{\sqrt{7-3x-2x^2}}dx$$

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90. Integrate the following function :

$$\int \frac{dx}{\sqrt{x^2-6x+10}}$$

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91. Integrate the following function :

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

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92. Integrate the following function :

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

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93. Integrate the following function :

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

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94. Integrate the following function :

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

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95. Integrate the following function :

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

Watch Video Solution

96. Integrate the following function :

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

Watch Video Solution

97. Integrate the following function :

$$\int \frac{x+3}{\sqrt{5-4x+x^2}}$$

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98. Integrate the following rational functions :

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

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99. Integrate the following rational functions :

$$\int \frac{dx}{x(x+2)}$$

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100. Integrate the following rational functions :

$$\int \frac{3x+4}{x^2-5x+6}dx$$

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101. Integrate the following rational functions :

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

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102. Integrate the following rational functions :

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

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103. Integrate the following rational functions :

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

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104. Integrate the following rational functions :

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

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105. Integrate the following rational functions :

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

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106. Integrate the following rational functions :

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

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107. Integrate the following rational functions :

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

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108. Integrate the following rational functions :

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

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109. Integrate the following rational functions :

$$\int \frac{\tan\theta + \tan^3\theta}{1 + \tan^3\theta}$$

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110. Integrate the following rational functions :

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

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111. Integrate the following rational functions :

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

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112. Integrate the following rational functions :

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

Watch Video Solution

113. Integrate the following rational functions :

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

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114. Integrate the following rational functions :

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

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115. Integrate the following rational functions :

$$\int \frac{5x}{(x+1)-\left(x^2+9\right)}dx$$

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116. Integrate the following functions :

$x\sin 2x$

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117. Integrate the following functions :

$e^{\sqrt{x}}$

Watch Video Solution

118. Integrate the following functions :

$(x\cos x)^2$

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119. Integrate the following functions :

$\sin 2x \log(\cos x)$

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120. Integrate the following functions :

$x^2 \tan^{-1} x$

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121. Integrate the following functions :

$$\frac{x}{1 - \cos x}$$

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122. Integrate the following functions :

$\sec^3 x$

Watch Video Solution

123. Integrate the following functions :

$x \cot x \operatorname{cosec}^2 x$

Watch Video Solution

124. Integrate the following functions :

$$\frac{\log x - 1}{(\log x)^2}$$

Watch Video Solution

125. Integrate the following functions :

$$e^x\left(\frac{2 + \sin 2x}{1 + \cos 2x}\right)$$

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126. Integrate the following functions :

$$e^x\left(\frac{1 + x\log x}{x}\right)$$

Watch Video Solution

127. Integrate the following functions :

$x\cos 3x$

Watch Video Solution

128. Integrate the following functions :

$x^{2n-1}.\ \cos x^n$

Watch Video Solution

129. Integrate the following functions :

$\tan^{-1}\left(\frac{2x}{1-x^2}\right)$

Watch Video Solution

130. Integrate the following functions :

$e^x(1+x)\log\left(xe^x\right)$

Watch Video Solution

131. Integrate the following functions :

$\left(\sin^{-1}x\right)^2$

Watch Video Solution

132. Integrate the following functions :

$x^3\sin x^2$

Watch Video Solution

133. Integrate the following functions :

$$\frac{5 + \log x}{(6 + \log x)^2}$$

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134. Integrate the following functions :

$\cos(\log x)$

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135. Integrate the following functions :

$\tan^{-1}\left(\sqrt{x}\right)$

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136. Integrate the following functions :

$$\int \sqrt{4x^2 - 5}dx$$

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137. Integrate the following functions :

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

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138. Integrate the following functions :

$$\int x^2\sqrt{8 - x^6}dx$$

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139. Integrate the following functions :

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

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140. Integrate the following functions :

$$\int \sqrt{2ax - x^2}dx$$

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141. Integrate the following functions :

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

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142. Integrate the following functions :

$$\int (2x - 5)\sqrt{x^2 - 4x + 3}dx$$

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143. Integrate the following functions :

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

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144. Integrate the following functions :

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

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145. Integrate the following functions :

$$\int \cos x\sqrt{9 - \sin^2 x}dx$$

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146. Evaluate the following definite integrals as limit of sums :

$$\int_1^3 \left(2x^2 + 7\right)dx$$

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147. Evaluate the following definite integrals as limit of sums :

$$\int_1^2 3^x dx$$

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148. Evaluate the following definite integrals as limit of sums :

$$\int_0^2 \left(e^x - x\right)dx$$

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149. Evaluate the following definite integrals as limit of sums :

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

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150. Evaluate the following definite integrals as limit of sums :

$$\int_1^4 \left(3x^2 + 2x + 5\right)dx$$

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151. Evaluate the following definite integrals as limit of sums :

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

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152. Evaluate the following definite integrals :

$$\int_0^1 \frac{dx}{2x - 3}$$

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153. Evaluate the following definite integrals :

$$\int_0^{\frac{\pi}{4}} \sqrt{1 + \sin 2x} dx$$

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154. Evaluate the following definite integrals :

$$\int_0^{\frac{\pi}{2}} \sin^4 x dx$$

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155. Evaluate the following definite integrals :

$$\int_1^3 \frac{dx}{x^2(x+1)}$$

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156. Evaluate the following definite integrals :

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

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157. Evaluate the following definite integrals :

$$\int_0^{\frac{\pi}{4}} \sin^3 2t \cos 2t\,dt$$

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158. Evaluate the following definite integrals :

$$\int_0^9 \frac{dx}{1+\sqrt{x}}$$

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159. Evaluate the following definite integrals :

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

View Text Solution

160. Evaluate the following definite integrals :

$$\int_0^{\frac{\pi}{2}} \sqrt{1 - \cos 2x}\,dx$$

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161. Evaluate the definite integrals

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

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162. Evaluate $\int_0^1 \frac{\tan^{-1}x}{1 + x^2}\,dx$

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163. Evaluate the following integrals :

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

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164. Evaluate the following integrals :

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

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165. Evaluate the following integrals :

$$\int_0^{\sqrt{2}} \sqrt{2 - x^2}dx$$

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166. Evaluate the following integrals :

$$\int_1^2 \frac{1}{x\left(1+x^2\right)}dx$$

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167. Evaluate the following integrals :

$$\int_{\frac{1}{4}}^{\frac{1}{2}} \frac{dx}{\sqrt{x-x^2}}$$

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168. Evaluate the following integrals :

$$\int_0^{\frac{\pi}{4}} \cos^4 x dx$$

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169. Evaluate the following integrals :

$$\int_1^3 \frac{\log x}{(x+1)^2} dx$$

Watch Video Solution

170. Evaluate the following integrals :

$$\int_0^{\pi} \frac{1}{1+\sin x} dx$$

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171. Evaluate the following integrals :

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

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172. Evaluate the following integrals.

$$\int_0^{\frac{\pi}{2}} \frac{\sqrt{\tan x}}{\sqrt{\tan x} + \sqrt{\cot x}} dx$$

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173. Evaluate the following integrals.

$$\int_0^1 x(1 - x)^{\frac{3}{2}} dx$$

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

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175. Evaluate the following integrals.

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

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176. Evaluate $\int_{\frac{\pi}{6}}^{\frac{\pi}{3}} \frac{dx}{1 + \sqrt{\tan x}}$

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177. Evaluate the following integrals.

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

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178. Evaluate the following integrals.

$\int_0^2 \left| x^2 + 2x - 3 \right| dx$

Watch Video Solution

179. Evaluate the following integrals.

$\int_{-\pi}^{\pi} x^{10}\sin^7 x dx$

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180. Evaluate the following integrals.

$\int_0^2 |3x - 5| dx$

Watch Video Solution

181. Evaluate the following integrals.

$\int_0^2 |3x - 5| dx$

Watch Video Solution

182. Integrate the following functions.

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

Watch Video Solution

183. Integrate the following functions.

$$\int \frac{\sqrt{x}}{\sqrt{a^3 - x^3}}dx$$

Watch Video Solution

184. Integrate the following functions.

$$\int x^{\frac{13}{2}}\left(1 + x^{\frac{5}{2}}\right)^{\frac{1}{2}}dx$$

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185. Integrate the following functions.

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

Watch Video Solution

186. Integrate the following functions.

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

Watch Video Solution

187. Integrate the following functions.

$$\int \frac{\cos x}{\cos(x - 2)} dx$$

Watch Video Solution

188. Integrate the following functions :

$$\int \frac{x-1}{\sqrt{x+4}}dx$$

Watch Video Solution

189. Find $\int \frac{\left(x^4 - x\right)^{\frac{1}{4}}}{x^5}dx$

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190. Find $\int \frac{x^4 dx}{(x-1)\left(x^2+1\right)}$

Watch Video Solution

191. Integrate the following functions.

$$\int \frac{dx}{\sin^3 x \cos^5 x}$$

Watch Video Solution

192. Integrate the following functions.

$$\int \sin^{-1}\sqrt{\frac{x}{x+a}}\,dx$$

Watch Video Solution

193. Integrate the following functions.

$$\int \frac{\sin x}{\sin 4x}\,dx$$

Watch Video Solution

194. Integrate the following functions.

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

Watch Video Solution

195. Integrate the following functions.

$$\int \log\left(2 + x^2\right)dx$$

Watch Video Solution

196. Integrate the following functions.

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

Watch Video Solution

197. Integrate the following functions.

$$\int \sqrt{\tan x}dx$$

Watch Video Solution

198. Integrate the following functions.

$$\int \frac{dx}{2 + 3\cos x}$$

Watch Video Solution

199. Integrate the following functions.

$$\int \frac{dx}{\cos x + \sqrt{3}\sin x}$$

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200. Integrate the following functions.

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

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201. Integrate the following functions.

$$\int \frac{x+2}{\left(x^2+3x+2\right)\sqrt{x+1}}dx$$

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202. Prove that $\int_0^{\frac{\pi}{2}} \sin 2x \log \tan x dx = 0$.

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203. Prove that $\int_0^1 \log\left(\frac{1}{x} - 1\right)dx = 0$.

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204. Find the value of $\int_0^1 \cot^{-1}\left(1 - x + x^2\right)dx$

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

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206. Prove that $\int_0^{\pi} \frac{x}{1-\cos\alpha\sin x}dx = \frac{\pi(\pi-\alpha)}{\sin\alpha}$

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207. Find the value of $\int_{-\frac{\pi}{4}}^{\frac{\pi}{4}} \frac{x+\frac{\pi}{4}}{2-\cos 2x}dx.$

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208. Find the value of $\int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} |\sin x|dx.$

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209. Evaluate $\int_{-1}^{\frac{3}{2}} |x\sin\pi x| dx$

Watch Video Solution

210. Find the value of $\int_0^1 \frac{e^{-x}}{1+e^x} dx$.

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211. Evaluate $\int_1^3 \left(x^2+x\right) dx$ as the limite of a sum.

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EXERCISE 7.1

1. Find an anti derivative (or integral) of the following functions by the method of inspection.

sin 2x

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2. Find an anti derivative (or integral) of the following functions by the method of inspection.

cos 3x

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3. Find an anti derivative (or integral) of the following functions by the method of inspection.

e^{2x}

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4. Find an anti derivative (or integral) of the following functions by the method of inspection.

$(ax+b)^2$

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5. Find an anti derivative (or integral) of the following functions by the method of inspection.

$\sin 2x - 4e^{3x}$

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6. Find the following integrals

$\int \left(4e^{3x}+1\right)dx$

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7. Find the following integrals

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

Watch Video Solution

8. Find the following integrals

$$\int\left(ax^2 + bx + c\right)dx$$

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9. Find the following intergrals in Eercise.

$$\int\left(2x^2 + e^x\right)dx$$

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10. Find the following integrals

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

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11. Find the following intergrals in Eercise.

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

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12. Find the following integrals

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

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13. Find the following intergrals in Eercise.

$$\frac{2x^{\frac{7}{2}}}{7} + 2x^{\frac{3}{2}} + 8x^{\frac{1}{2}} + c$$

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14. Find the following integrals

$$\int (1 - x)\sqrt{x}dx$$

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15. Find the following integrals

$$\int \sqrt{x}\left(3x^2 + 2x + 3\right)dx$$

Watch Video Solution

16. Find the following integrals

$$\int\left(2x - 3\cos x + e^x\right)dx$$

Watch Video Solution

17. Find the following integrals

$$\int\left(2x^2 - 3\sin x + 5\sqrt{x}\right)dx$$

Watch Video Solution

18. Find the following intergrals in Eercise.

$$\int \sec x(\sec x + \tan x)dx$$

Watch Video Solution

19. Find the following integrals

$$\int \frac{\sec^2 x}{\operatorname{cosec}^2 x} dx$$

Watch Video Solution

20. Find the following integrals

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

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21. Choose the correct answer

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

Answer: C

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22. Choose the correct answer

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

Answer: A

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EXERCISE 7.2

1. Integrate the functions

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

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2. Integrate the functions

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

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3. Integrate the function in Exercise.

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

Watch Video Solution

4. Integrate the functions

$\sin x \sin(\cos x)$

Watch Video Solution

5. Integrate the functions

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

Watch Video Solution

6. Integrate the functions

$\sqrt{ax + b}$

Watch Video Solution

7. Integrate the function in Exercise.

$x\sqrt{x + 2}$

Watch Video Solution

8. Integrate the functions

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

Watch Video Solution

9. Integrate the functions

$$(4x + 2)\sqrt{x^2 + x + 1}$$

Watch Video Solution

10. Integrate the function in Exercise.

$$\frac{1}{x - \sqrt{x}}$$

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11. Integrate the function in Exercise.

$$\frac{x}{\sqrt{x+4}}, x > -4$$

Watch Video Solution

12. Integrate the function in Exercise.

$$\left(x^3 - 1\right)^{\frac{1}{3}} x^5$$

Watch Video Solution

13. Integrate the functions

$$\frac{x^2}{\left(2 + 3x^3\right)^3}$$

Watch Video Solution

14. Integrate the functions

$$\frac{1}{x(\log x)^m}, x > 0, m \neq 1$$

Watch Video Solution

15. Integrate the functions

$$\frac{x}{9 - 4x^2}$$

Watch Video Solution

16. Integrate the function in Exercise.

$$e^{2x} + 3$$

Watch Video Solution

17. Integrate the functions

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

Watch Video Solution

18. Integrate the functions

$$\frac{e^{\tan^{-1} x}}{1 + x^2}$$

Watch Video Solution

19. Integrate the functions

$$\frac{e^{2x} - 1}{e^{2x} + 1}$$

Watch Video Solution

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. Integrate the functions

$\sec^2(7 - 4x)$

Watch Video Solution

23. Integrate the functions

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

Watch Video Solution

24. Integrate the function in Exercise.

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

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25. Integrate the functions

$$\frac{1}{\cos^2 x(1-\tan x)^2}$$

Watch Video Solution

26. Integrate the function in Exercise.

$$\frac{\cos\sqrt{x}}{\sqrt{x}}$$

Watch Video Solution

27. Integrate the function in Exercise.

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

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28. Integrate the functions

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

Watch Video Solution

29. Integrate the functions

cot x log sin x

Watch Video Solution

30. Integrate the functions

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

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. Integrate the functions

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

Watch Video Solution

34. Integrate the functions

$$\frac{\sqrt{\tan x}}{\sin x \cos x}$$

Watch Video Solution

35. Integrate the function in Exercise.

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

Watch Video Solution

36. Integrate the functions

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

Watch Video Solution

37. Integrate the function in Exercise.

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

Watch Video Solution

38. Choose the correct answer

$$\int \frac{10x^9 + 10^x \log_e 10 dx}{x^{10} + 10^x} \text{ equals}$$

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

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

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

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

Answer: D

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

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

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

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

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

Answer: B

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EXERCISE 7.3

1. Find the integrals of the functions in Exercise.

$\sin^2(2x + 5)$

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2. Find the integrals of the functions in Exercise.

$\sin 3x \cos 4x$

Watch Video Solution

3. Find the integrals of the functions in Exercise.

$\cos 2x \cos 4x \cos 6x$

Watch Video Solution

4. Find the integrals of the functions in Exercise.

$\sin(2x + 1)$

Watch Video Solution

5. Find the integrals of the functions in Exercise.

$\sin^3 x \cos^3 x$

Watch Video Solution

6. Find the integrals of the functions

sin x sin 2x sin 3x

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7. Find the integrals of the functions

sin 4x sin 8x

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8. Find the integrals of the functions

$$\frac{1 - \cos x}{1 + \cos x}$$

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9. Find the integrals of the functions in Exercise.

$$\frac{\cos x}{1+\cos x}$$

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10. Find the integrals of the functions

$$\sin^4 x$$

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11. Find the integrals of the functions in Exercise.

$$\cos^4 2x$$

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12. Find the integrals of the functions

$$\frac{\sin^2 x}{1 + \cos x}$$

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13. Find the integrals of the functions

$$\frac{\cos 2x - \cos 2\alpha}{\cos x - \cos \alpha}$$

Watch Video Solution

14. Find the integrals of the functions

$$\frac{\cos x - \sin x}{1 + \sin 2x}$$

Watch Video Solution

15. Find the integrals of the functions

$\tan^3 2x \sec 2x$

Watch Video Solution

16. Find the integrals of the functions

$\tan^4 x$

Watch Video Solution

17. Find the integrals of the functions

$$\frac{\sin^3 x + \cos^3 x}{\sin^2 x \cos^2 x}$$

Watch Video Solution

18. Find the integrals of the functions

$$\frac{\cos 2x + 2\sin^2 x}{\cos^2 x}$$

Watch Video Solution

19. Find the integrals of the functions in Exercise.

$$\frac{1}{\sin x \cos^2 x}$$

Watch Video Solution

20. Find the integrals of the functions

$$\frac{\cos 2x}{(\cos x + \sin x)^2}$$

Watch Video Solution

21. Find the integrals of the functions

$\sin^{-1}(\cos x)$

Watch Video Solution

22. Find the integrals of the functions

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

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23. Choose the correct answer

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

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

B. $\tan x + \operatorname{cosec} x + c$

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

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

Answer: A

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24. Choose the correct answer

$\int \frac{e^x(1+x)}{\cos^2(e^x x)}dx$ equals

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EXERCISE 7.4

1. Integrate the functions in exercise.

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

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2. Integrate the functions in exercise.

$$\frac{1}{\sqrt{1 + 4x^2}}$$

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3. Integrate the function

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

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4. Integrate the functions in exercise.

$$\frac{1}{\sqrt{9 - 25x^2}}$$

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5. Integrate the function

$$\frac{3x}{1 + 2x^4}$$

Watch Video Solution

6. Integrate the functions in exercise.

$$\frac{x^2}{1 - x^6}$$

Watch Video Solution

7. Integrate the functions in exercise.

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

Watch Video Solution

8. Integrate the function

$$\frac{x^2}{\sqrt{x^6 + a^6}}$$

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9. Integrate the function

$$\frac{\sec^2 x}{\sqrt{\tan^2 x + 4}}$$

Watch Video Solution

10. Integrate the functions in exercise.

$$\frac{1}{\sqrt{x^2 - 2x + 2}}$$

Watch Video Solution

11. Integrate the function

$$\frac{1}{9x^2 + 6x + 5}$$

Watch Video Solution

12. Integrate the functions in exercise.

$$\frac{1}{\sqrt{7 - 6x - x^2}}$$

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13. Integrate the function

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

Watch Video Solution

14. Integrate the function

$$\frac{1}{\sqrt{8 + 3x - x^2}}$$

Watch Video Solution

15. Integrate the functions in exercise.

$$\frac{1}{\sqrt{(x - a)(x - b)}}$$

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16. Integrate the function

$$\frac{4x + 1}{\sqrt{2x^2 + x - 3}}$$

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17. Integrate the function

$$\frac{x + 2}{\sqrt{x^2 - 1}}$$

Watch Video Solution

18. Integrate the function

$$\frac{5x - 2}{1 + 2x + 3x^2}$$

Watch Video Solution

19. Integrate the function

$$\frac{6x + 7}{\sqrt{(x - 5)(x - 4)}}$$

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20. Integrate the function

$$\frac{x+2}{\sqrt{4x-x^2}}$$

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21. Integrate the function

$$\frac{x+2}{\sqrt{x^2+2x+3}}$$

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22. Integrate the functions in exercise.

$$\frac{x+3}{x^2-2x-5}$$

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23. Integrate the functions in exercise.

$$\frac{5x+3}{\sqrt{x^2+4x+10}}$$

Watch Video Solution

24. Choose the correct answer

$\int \frac{dx}{x^2+2x+2}$ equals

A. $x\tan^{-1}(x+1)+c$

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

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

D. $\tan^{-1}x+c$

Answer: B

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25. Choose the correct answer

$\int \frac{dx}{\sqrt{9x - 4x^2}}$ 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. $\frac{1}{3}\sin^{-1}\left(\frac{8x - 8}{8}\right) + c$

D. $\frac{1}{2}\sin^{-1}\left(\frac{9x - 8}{9}\right) + c$

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. Integrate the rational functions

$$\frac{1}{x^2 - 9}$$

Watch Video Solution

3. Integrate the rational functions

$$\frac{3x - 1}{(x - 1)(x - 2)(x - 3)}$$

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4. Integrate the rational functions

$$\frac{x}{(x - 1)(x - 2)(x - 3)}$$

Watch Video Solution

5. Integrate the rational functions

$$\frac{2x}{x^2 + 3x + 2}$$

Watch Video Solution

6. Integrate the rational functions

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

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7. Integrate the rational functions

$$\frac{2x}{\left(x^2 + 1\right)\left(x^2 + 3\right)}$$

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8. Integrate the rational functions

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

Watch Video Solution

9. Integrate the rational functions

$$\frac{3x+5}{x^3-x^2-x+1}$$

Watch Video Solution

10. Integrate the rational functions

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

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11. Integrate the rational functions

$$\frac{5x}{(x+1)\left(x^2-4\right)}$$

Watch Video Solution

12. Integrate the rational functions

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

Watch Video Solution

13. Integrate the rational functions

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

Watch Video Solution

14. Integrate the rational functions

$$\frac{3x - 1}{(x + 2)^2}$$

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15. Integrate the rational functions in exercise.

$$\frac{1}{x^4 - 1}$$

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16. Integrate the rational functions in exercise.

$$\frac{1}{x\left(x^n - 1\right)}$$

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17. Integrate the rational functions in exercise.

$$\frac{\cos x}{(1 - \sin x)(2\sin x)}$$

Watch Video Solution

18. Integrate the rational functions

$$\frac{\left(x^2+1\right)\left(x^2+2\right)}{\left(x^2+3\right)\left(x^2+4\right)}$$

Watch Video Solution

19. Integrate the rational functions

$$\frac{2x}{\left(x^2+1\right)\left(x^2+3\right)}$$

Watch Video Solution

20. Integrate the rational functions

$$\frac{1}{x\left(x^4 - 1\right)}$$

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21. Integrate the rational functions

$$\frac{1}{\left(e^x - 1\right)}$$ [Hint : Put e^x = t]

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22. Choose the correct answer

$\int \frac{xdx}{(x - 1)(x - 2)}$ equals

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

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

C. $\log\left|\left(\frac{(x-1)^2}{x-2}\right)\right| + c$

D. $\log|(x-1)(x-2)| + c$

Answer: B

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23. Choose the correct answer

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

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

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

C. $-\log|x| + \frac{1}{2}\log\left(x^2+1\right) + c$

D. $\frac{1}{2}\log|x| + \log\log\left(x^2+1\right) + c$

Answer: A

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EXERCISE 7.6

1. Integrate the function in Exercise.

$x\sin$

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2. Integrate the function in Exercise.

$x\sin 3x$

Watch Video Solution

3. Integrate the function in Exercise.

$x^2 e^x$

Watch Video Solution

4. Integrate the function in Exercise.

$x\log x$

Watch Video Solution

5. Integrate the function in Exercise.

$x\log 2x$

Watch Video Solution

6. Integrate the function in Exercise.

$x^2\log x$

Watch Video Solution

7. Integrate the function in Exercise.

$x \sin^{-1} x$

Watch Video Solution

8. Integrate the function in Exercise.

$x \tan^{-1} x$

Watch Video Solution

9. Integrate the function in Exercise.

$x \cos^{-1} x$

Watch Video Solution

10. Integrate the function in Exercise.

$$\left(\sin^{-1}x\right)^2$$

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11. Integrate the functions

$$\frac{x\cos^{-1}x}{\sqrt{1-x^2}}$$

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12. Integrate the function in Exercise.

$$x\sec^2 x$$

Watch Video Solution

13. Integrate the functions

$\tan^{-1}x$

Watch Video Solution

14. Integrate the functions

$x(\log x)^2$

Watch Video Solution

15. Integrate the function in Exercise.

$\left(x^2 + 1\right)\log x$

Watch Video Solution

16. Integrate the function in Exercise.

$e^x(\sin x + \cos x)$

Watch Video Solution

17. Integrate the function in Exercise.

$$\frac{xe^4}{(1 + x)^2}$$

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18. Integrate the function in Exercise.

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

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19. Integrate the function in Exercise.

$$e^x\left(\frac{1}{x} - \frac{1}{x^2}\right)$$

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20. Integrate the function in Exercise.

$$\frac{(x - 3)e^x}{(x - 1)^3}$$

View Text Solution

21. Integrate the function in Exercise.

$$e^{2x}\sin x$$

View Text Solution

22. Integrate the function in Exercise.

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

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23. Choose the correct answer

$\int x^2 e^{x^3} dx$ equals

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

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

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

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

Answer: A

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24. Choose the correct answer

$\int e^{x}\sec x(1 + \tan x)dx$ equals

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

B. $e^{x}\sec x + c$

C. $e^{x}\sin x + c$

D. $e^{x}\tan x + c$

Answer: B

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EXERCISE 7.7

1. Integrate the function is exercise.

$\sqrt{4 - x^{2}}$

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2. Integrate the function is exercise.

$\sqrt{1 - 4x^2}$

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3. Integrate the function is exercise.

$\sqrt{x^2 + 4x + 6}$

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4. Integrate the function is exercise.

$\sqrt{x^2 + 4x + 1}$

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5. Integrate the function is exercise.

$\sqrt{1 - 4x - x^2}$

Watch Video Solution

6. Integrate the function is exercise.

$\sqrt{x^2 + 4x - 5}$

Watch Video Solution

7. Integrate the function is exercise.

$\sqrt{1 + 3x - x^2}$

Watch Video Solution

8. Integrate the function is exercise.

$\sqrt{x^2 + 3x}$

Watch Video Solution

9. Integrate the function is exercise.

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

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10. $\int \sqrt{1 + x^2} dx = ...$

A. $\frac{x}{2}\sqrt{1 + x^2} + \frac{1}{2}\log\left|\left(x + \sqrt{1 + x^2}\right)\right| + c$

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

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

D. $\frac{x^2}{2}\sqrt{1 + x^2} + \frac{1}{2}x^2\log\left|x + \sqrt{1 + x^2}\right| + c$

Answer: A

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11. $\int \sqrt{x^2 - 8x + 7}dx = ...$

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. $\frac{1}{2}(x - 4)\sqrt{x^2 - 8x + 7} - 3\sqrt{2}\log x + 4 + \sqrt{x^2 - 8x + 7} \mid + c$

D. $\frac{1}{2}(x + 4)\sqrt{x^2 - 8x + 7} + \frac{9}{2}\log\left|x - 4 + \sqrt{x^2 - 8x + 7}\right| + c$

Answer: D

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12. $x\sqrt{x + x^2}$

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13. $(x+1)\sqrt{2x^2+3}$

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14. $(x+3)\sqrt{3-4x-x^2}$

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EXERCISE 7.8

1. Evaluate the following definite intergrals as limit of sums.

b

$xadx$

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2. Evaluate the following definite intergrals as limit of sums.

b

$x + 1adx$

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3. Evaluate the following definite intergrals .

3

$\int 2x^2 dx$

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

$\int_1^4 \left(x^2 - x\right) dx$

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

$\int_{-1}^{1} e^x dx$

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6. Evaluate the following definite intergrals as limit of sums.

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

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7. find the following definite trigonometric integral as limit of sums.

$\int_0^{\pi} \sin x dx$

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EXERCISE 7.9

1. Evaluate the definite integrals

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

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2. Evaluate the definite integrals

$$\int_{2}^{3}\frac{1}{x}dx$$

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3. Evaluate the definite integral in exercise

$$\overset{3}{\frac{1\,2}{2}}dx$$

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4. Evaluate the definite integrals

$\int_0^{\frac{\pi}{4}} \sin 2x dx$

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5. Evaluate the definite integrals

$\int_0^{\frac{\pi}{2}} \cos 2x dx$

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6. Evaluate the definite integral in exercise

$\int^{5} 4e^{x} dx$

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7. Evaluate the definite integral in exercise

$$\frac{\pi}{4}$$

$$\tan x 0 dx$$

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8. Evaluate the definite integral in exercise

$$\frac{\pi}{4}$$

$$\int_{0}^{\frac{\pi}{}} \operatorname{cosec} x dx$$

Watch Video Solution

9. Evaluate the definite integral in exercise

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

Watch Video Solution

10. Evaluate the definite integral in exercise

$$underst(0)\int^{1} \frac{dx}{1+x^2}$$

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11. Evaluate the definite integrals

$$\int_2^3 \frac{dx}{x^2-1}$$

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12. Evaluate the definite integrals

$$\int_0^{\frac{\pi}{2}} \cos^2 x dx$$

Watch Video Solution

13. Evaluate the definite integral in exercise

$$\int_2^3 \frac{x\,dx}{x^2+1}$$

Watch Video Solution

14. Evaluate the definite integral in exercise

$$\int_0^1 \frac{2x+3}{5x^2+1}$$

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15. Evaluate the definite integral in exercise

$$\int_0^1 xe^{x^2}dx$$

Watch Video Solution

16. Evaluate the definite integrals

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

Watch Video Solution

17. Evaluate the definite integral in exercise

$$\int_0^{\frac{\pi}{4}} \left(2\sec^2 x + x^3 + 2\right) dx$$

Watch Video Solution

18. Evaluate the definite integral in exercise

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

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19. Evaluate the definite integral in exercise

$$\int_0^2 \frac{6x+3}{x^2+4}\,dx$$

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20. Evaluate the definite integral in exercise

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

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21. $\int_1^{\sqrt{3}} \frac{dx}{1+x^2} = \ldots.$

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

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

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

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

Answer: D

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22. $\int_0^{\frac{2}{3}} \frac{dx}{4+9x^2} = ...$

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

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

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

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

Answer: C

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EXERCISE 7.10

1. Evaluate the integrals in exercise.

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

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2. Evaluate the integrals by using substitution

$$\int_0^{\frac{\pi}{2}} \sqrt{\sin\phi}\cos^5\phi\, d\phi$$

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3. Evaluate the integrals by using substitution

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

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4. Evaluate the integrals in exercise.

$$\int_0^2 \sqrt{x+2}\,dx$$

Watch Video Solution

5. Evaluate the integrals in exercise.

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

Watch Video Solution

6. Evaluate the integrals by using substitution

$$\int_0^2 \frac{dx}{x+4-x^2}$$

Watch Video Solution

7. Evaluate the integrals in exercise.

$$\int_{-x}^{1} \frac{dx}{x^2 + 2x + 5}$$

Watch Video Solution

8. Evaluate the integrals in exercise.

$$\frac{1}{x} - \frac{1}{2x^2} \, {}_{1}^{2} e^{2x} + dx$$

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9. Choose the correct answer

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

A. 6

B. 0

C. 3

D. 4

Answer: A

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10. If $f(x) = \int_0^x t\sin t\,dt$, then f(x)=.....

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

B. $x\sin x$

C. $x\cos x$

D. $\sin x x + x\cos x$

Answer: B

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EXERCISE 7.11

1. By using the properties of definite integrals evaluate the integrals in exercise.

$$\int_0^{\frac{\pi}{2}} \cos^2 x dx$$

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2. By using the properties of definite integrals evaluate the integrals in exercise.

$$\int_0^{\frac{\pi}{2}} \frac{\sqrt{\sin x}}{\left(\sqrt{\sin x} + \sqrt{\cos x}\right)} dx$$

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3. By using the properties of definite integrals evaluate the integrals in exercise.

$$\int_{0}^{\frac{\pi}{2}} \frac{\sin^{\frac{3}{2}} x dx}{\sin^{\frac{3}{2}} x + \cos^{\frac{3}{2}} x}$$

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4. By using the properties of definite integrals evaluate the integrals in exercise.

$$\int_{0}^{\frac{\pi}{2}} \frac{\cos^5 x}{\sin^5 x + \cos^5 x} dx$$

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5. By using the properties of definite integrals evaluate the integrals in exercise.

$$\int_{-5}^{5} |x + 2| dx$$

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6. By using the properties of definite integrals evaluate the integrals in exercise.

$$\int_2^8 |x - 5| dx$$

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7. By using the properties of definite integrals evaluate the integrals in exercise.

$$\int_0^1 x(1 - x)^n dx$$

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8. By using the properties of definite integrals evaluate the integrals in exercise.

$$\int_0^{\frac{\pi}{4}} \log(1 + \tan x) dx$$

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9. By using the properties of definite integrals, evaluate the integrals

$$\int_0^2 x\sqrt{2-x}\,dx$$

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10. By using the properties of definite integrals evaluate the integrals in exercise.

$$\int_0^{\frac{\pi}{2}} (2\log\sin x - \log\sin 2x)\,dx$$

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11. By using the properties of definite integrals, evaluate the integrals

$$\int_{\frac{-\pi}{2}}^{\frac{\pi}{2}} \sin^2 x\,dx$$

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12. By using the properties of definite integrals, evaluate the integrals

$$\int_0^{\pi} \frac{x dx}{1 + \sin x}$$

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13. By using the properties of definite integrals, evaluate the integrals

$$\int_{\frac{-\pi}{2}}^{\frac{\pi}{2}} \sin^7 x dx$$

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14. By using the properties of definite integrals, evaluate the integrals

$$\int_0^{2\pi} \cos^5 x dx$$

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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. By using the properties of definite integrals, evaluate the integrals

$$\int_0^{\pi} \log(1 + \cos x) dx$$

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17. By using the properties of definite integrals evaluate the integrals in exercise.

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

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18. By using the properties of definite integrals, evaluate the integrals

$\int_0^4 |x - 1| dx$

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19. Show that $\int_0^a f(x)g(x)dx = 2\int_0^a f(x)dx$, if f and g are defined as f (x) = f (a - x) and g(x) + g(a - x) = 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. π

D. 1

Answer: C

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21. Choose the correct answer

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

A. 2

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

C. 0

D. -2

Answer: C

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MISCELLANEOUS EXERCISE-7

1. Integrate the function is Exercise.

$$\frac{1}{x - x^3}$$

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2. Integrate the function is Exercise.

$$\frac{1}{\sqrt{x + a} + \sqrt{x + b}}$$

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3. Integrate the functions

$\frac{1}{x\sqrt{ax - x^2}}$ [Hint: Put x = $\frac{a}{t}$]

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4. Integrate the function is Exercise.

$$\frac{I}{x^2\left(x^4+1\right)^{\frac{3}{4}}}$$

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5. Integrate the functions

$$\frac{1}{x^{\frac{1}{2}}+x^{\frac{1}{3}}}\text{ [Hint: }\frac{1}{x^{\frac{1}{2}}+x^{\frac{1}{3}}}=\frac{1}{x^{\frac{1}{3}}\left(1+x^{\frac{1}{6}}\right)}\text{, put } x=t^6\text{]}$$

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6. Integrate the functions

$$\frac{5x}{(x+1)\left(x^2+9\right)}$$

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7. Integrate the functions

$$\frac{\sin x}{\sin(x - a)}$$

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8. Integrate the function is Exercise.

$$\frac{e^{5\log} - e^{4\log x}}{e^{3\log x} - e^{2\log x}}$$

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9. Integrate the function

$$\frac{x + 2}{\sqrt{4x - x^2}}$$

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10. Integrate the functions

$$\frac{\sin^8 - \cos^8 x}{1 - 2\sin^2 x\cos^2 x}$$

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11. Find the integrals of the functions

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

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12. Integrate the functions

$$\frac{x^3}{\sqrt{1 - x^8}}$$

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13. Integrate the functions

$$\frac{e^x}{\left(1+e^x\right)\left(2+e^x\right)}$$

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14. Integrate the function is Exercise.

$$\frac{1}{\left(x^2+1\right)\left(x^2+4\right)}$$

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15. Integrate the function is Exercise.

$$\cos^3 x e^{\log \sin x}$$

Watch Video Solution

16. Integrate the functions

$$e^{3\log x}\left(x^4 + 1\right)^{-1}$$

Watch Video Solution

17. Integrate the functions

$$f'(ax + b)[f(ax + b)]^n$$

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18. Integrate the function is.

$$\frac{1}{\sqrt{\sin^3 x \sin(x + \alpha)}}$$

Watch Video Solution

19. Integrate the function is Exercise.

$$\frac{\sin^{-1}\sqrt{x} - \cos^{-1}\sqrt{x}}{\sin^{-1}\sqrt{x} + \cos^{-1}\sqrt{x}}, x \in [0, 1]$$

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20. Integrate the function is Exercise.

$$\sqrt{\frac{1 - \sqrt{x}}{1 + \sqrt{x}}}$$

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21. Integrate the functions

$$\frac{2 + \sin 2x}{1 + \cos 2x} e^x$$

Watch Video Solution

22. Integrate the function is Exercise.

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

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23. Integrate the functions

$$\tan^{-1}\sqrt{\frac{1 - x}{1 + x}}$$

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24. Integrate the function is $\frac{x\cos^{-1}x}{\sqrt{1 - x^2}}$

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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 the definite integrals

$$\int_0^{\frac{\pi}{4}} \frac{\sin x \cos x}{\cos^4 x + \sin^4 x} dx$$

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27. Evaluate the definite integrals in exercise.

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

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28. Evaluate the definite integrals in exercise.

$$\int_{\frac{\pi}{6}}^{\frac{\pi}{3}} \frac{\sin x + \cos x}{\sqrt{\sin 2x}} dx$$

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29. Evaluate the definite integrals

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

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30. Evaluate the definite integrals

$$\int_0^{\frac{\pi}{4}} \frac{\sin x + \cos x}{9 + 16\sin 2x} dx$$

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31. Evaluate the definite integrals

$$\int_0^{\frac{\pi}{2}} \sin 2x \tan^{-1}(\sin x) dx$$

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32. Evaluate the definite integrals

$$\int_0^{\pi} \frac{x \tan x}{\sec x + \tan x} dx$$

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33. Evaluate the definite integrals

$$\int_1^4 [|x - 1| + |x - 2| + |x - 3|] dx$$

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34. Evaluate the following definite integrals :

$$\int_1^3 \frac{dx}{x^2(x+1)}$$

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35. Prove the following

$$\int_0^1 xe^x dx = 1$$

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36. Prove the following

$$\int_{-1}^1 x^{17}\cos^4 x dx = 0$$

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37. Prove the following

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

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38. Prove the following

$$\int_0^{\frac{\pi}{4}} 2\tan^3 x dx = 1 - \log 2$$

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39. Prove the following

$$\int_0^1 \sin^{-1} x dx = \frac{\pi}{2} - 1$$

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40. Evaluate $\int_0^1 e^{2-3x}dx$ as a limit of a sum.

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41. Choose the correct answers

$\int \frac{dx}{e^x + e^{-x}}$ is equal to

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

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

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

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

Answer: A

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42. Choose the correct answers

$\int \frac{\cos 2x}{(\sin x + \cos x)^2} dx$ is equal to

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43. Choose the correct answers

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

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

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

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

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

Answer: D

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44. Choose the correct answers

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

A. 1

B. 0

C. -1

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

Answer: B

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TEXTBOOK ILLUSTRATIONS FOR PRACTICE WORK

1. Write an anti derivative for each of the following functions using the method of inspection:

(i) cos2x (ii) $3x^2+4x^3$ (iii) $\frac{1}{x}, x \neq 0$

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2. Find the following integrals:

(i) $\int \frac{x^3 - 1}{x^2} dx$ (ii) $\int \left(x^{\frac{2}{3}} + 1\right) dx$ (iii) $\int \left(x^{\frac{3}{2}} + 2e^x - \frac{1}{x}\right) dx$

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3. Find the following integrals :

(i) $\int (\sin x + \cos x) dx$

(ii) $\int \operatorname{cosec} x(\operatorname{cosec} x + \cot x) dx$

(iii) $\int \frac{1 - \sin x}{\cos^2 x} dx$

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4. Find the anti derivative F of f defined by f (x) = $4x^3 - 6$, where F (0) =

3

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5. Integrate the following functions w.r.t. x:

(i) sinmx (ii) $2x\sin\left(x^2+1\right)$ (iii) $\dfrac{\tan^4\sqrt{x}\sec^2\sqrt{x}}{\sqrt{x}}$ (iv) $\dfrac{\sin\left(\tan^{-1}x\right)}{1+x^2}$

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6. Find the following integrals:

(i) $\int\sin^3 x\cos^2 x dx$ (ii) $\int\dfrac{\sin x}{\sin(x+a)}dx$ (iii) $\int\dfrac{1}{1+\tan x}dx$

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7. Find (i) $\int\cos^2 x,\ dx(ii)\int\sin(2x)\cos(3x)dx,$

(iii) $\int\sin^3 x dx.$

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8. Find the following integrals:

$\int \frac{dx}{x^2 - 16}$ (ii) $\int \frac{dx}{\sqrt{2x - x^2}}$

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9. Find the following integral :

$$\int \frac{dx}{x^2 - 6x + 13}$$

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10. Find the following integral :

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

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11. Find $\int \frac{dx}{(x + 1)(x + 2)}$

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

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

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

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15. Find $\int \frac{(3\sin\phi - 2)\cos\phi}{5 - \cos^2\phi - 4\sin\phi} d\phi$

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

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17. Find $\int x\cos x dx.$

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18. Find $\int \log x dx$

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19. Find $\int xe^x dx$

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

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21. Find $\int e^x \sin x$.

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22. Find (i) $\int e^x\left(\tan^{-1}x+\frac{1}{1+x^2}\right)dx$ (ii) $\int \frac{\left(x^2+1\right)e^x}{(x+1)^2}dx$

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23. Find $\int \sqrt{x^2+2x+5}dx$

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

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25. Find $\int x\sqrt{1 + x - x^2} dx$ as the limit of sum.

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26. Find $\int_0^2 \left(x^2 + 1\right) dx$ as the limit of a sum.

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27. Evaluate $\int_0^2 e^x dx$ as the limit of a sum.

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28. Evaluate the following integrals:

(i) $\int_2^3 x^2 dx$ (ii) $\int_4^9 \frac{\sqrt{x}}{\left(30 - x^{\frac{3}{2}}\right)^2} dx$

(iii) $\int_1^2 \frac{xdx}{(x+1)(x+2)}$ (iv) $\int_0^{\frac{\pi}{4}} \sin^3 2t \cos 2t dt$

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29. Evaluate $\int_{-1}^{1} 5x^4\sqrt{x^5 + 1}dx$

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30. Evaluate $\int_0^1 \frac{\tan^{-1}x}{1+x^2} dx$

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31. Evaluate $\int_{-1}^{2}\left|x^3 - x\right|dx$

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32. Evaluate $\int_{\frac{-\pi}{4}}^{\frac{\pi}{4}}\sin^2 x\text{dx}$

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

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34. Evaluate $\int_{-1}^{1}\sin^5 x\cos^4 x dx$

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

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36. Evaluate $\int_{\frac{\pi}{6}}^{\frac{\pi}{3}} \frac{dx}{1 + \sqrt{\tan x}}$

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

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38. Evaluate $\int \cos(6x)\sqrt{1 + \sin(6x)} dx.$

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39. Find $\int \frac{\left(x^4 - x\right)^{\frac{1}{4}}}{x^5}dx$

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40. Find $\int \frac{x^4 dx}{(x - 1)\left(x^2 + 1\right)}$

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

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42. Find $\int \left[\sqrt{\cot x} + \sqrt{\tan x}\right]dx$

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43. Find $\int \frac{\sin 2x \cos 2x dx}{\sqrt{9 - \cos^4(2x)}}$

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44. Evaluate $\int_{-1}^{\frac{3}{2}} |x \sin \pi x| dx$

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

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SOLUTIONS OF NCERT EXEMLAR PROBLEMS (Short Answer Type Questions)

1. Obtain the following integrals :

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

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2. Obtain the following integrals :

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

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3. Obtain the following integrals :

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

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4. Obtain the following integrals :

$$\int \frac{e^{6\log x} - e^{5\log x}}{e^{4\log x} - e^{3\log x}} dx$$

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5. Obtain the following integrals :

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

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6. Obtain the following integrals :

$$\int \frac{1}{1 + \cos x} dx$$

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7. Obtain the following integrals :

$$\int \tan^2 x \sec^4 x dx$$

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8. Obtain the following integrals :

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

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9. Obtain the following integrals :

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

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10. Obtain the following integrals :

$$\int \frac{x}{\sqrt{x} + 1} dx$$

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11. Obtain the following integrals :

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

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12. Obtain the following integrals :

$$\int \frac{x^{\frac{1}{2}}}{1 + x^{\frac{3}{4}}} dx$$

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13. Obtain the following integrals :

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

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14. Obtain the following integrals :

$$\int \frac{1}{\sqrt{16 - 9x^2}} dx$$

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15. Obtain the following integrals :

$$\int \frac{1}{\sqrt{3t - 2t^2}} dt$$

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16. Obtain the following integrals :

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

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17. Obtain the following integrals :

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

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18. Obtain the following integrals :

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

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19. Obtain the following integrals :

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

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20. Obtain the following integrals :

$$\int \sqrt{ax - x^2} dx$$

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21. Obtain the following integrals :

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

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22. Obtain the following integrals :

$$\int \frac{\cos(5x) + \cos(4x)}{1 - 2\cos(3x)} dx$$

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23. Find the integrals of the following functions :

$$\int \frac{\sin^6 x + \cos^6 x}{\sin^2 x \cos^2 x} dx$$

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24. Integrate the following functions.

$$\int \frac{\sqrt{x}}{\sqrt{a^3 - x^3}} dx$$

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25. Find the following integrals

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

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26. Obtain the following integrals :

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

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27. Represent as limit of sum : $\int_0^2 \left(x^2 + 3\right) dx$

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28. Represent as limit of sum : $\int_0^2 e^x dx$

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29. Obtain following definite integrals :

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

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30. Obtain following definite integrals :

$$\int_0^{\frac{\pi}{2}} \frac{\tan x}{1 + m^2 \tan^2 x} dx$$

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31. Obtain following definite integrals :

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

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32. Obtain following definite integrals :

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

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33. Obtain following definite integrals :

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

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SOLUTIONS OF NCERT EXEMLAR PROBLEMS (Long Answer Type Questions)

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

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

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3. $\int_0^{\pi} \frac{x}{1 + \sin x} dx$

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4. Integrate the following rational functions :

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

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5. $\int \frac{e^{\tan^{-1}(x)}}{1 + x^2}\left(1 + x + x^2\right) dx = \ldots + c$

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6. $\int \sin\left(\sqrt{\frac{x}{x+a}}\right)dx$

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7. $\int_{\frac{\pi}{3}}^{\frac{\pi}{2}} \frac{\sqrt{1+\cos x}}{(1-\cos x)^{\frac{5}{2}}}dx$

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8. $\int e^{-3x}\cos^3 x dx$

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

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

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11. $\int_0^{1} x\log(1 + 2x)dx$

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12. $\int_0^{\pi} x\log(\sin x)dx$

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13. $\int_{-\frac{\pi}{4}}^{\frac{\pi}{4}} \log(\sin x + \cos x)dx$

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SOLUTIONS OF NCERT EXEMLAR PROBLEMS (Objective Type Questions)

1. $\int \frac{\cos 2x - \cos 2\theta}{\cos x - \cos\theta} dx = ... + C$

A. $2(\sin x + x\cos\theta)$

B. $2(\sin x - x\cos\theta)$

C. $2(\sin x + 2x\cos\theta)$

D. $2(\sin x - 2x\cos\theta)$

Answer: A

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2. $\int \frac{dx}{\sin(x-a)\sin(x-b)} = ... + C$

A. $\sin(b - a)\log\left|\dfrac{\sin(x - b)}{\sin(x - b)}\right|$

B. $\operatorname{cosec}(b - a)\log\left|\dfrac{\sin(x - b)}{\sin(x - b)}\right|$

C. $\operatorname{cosec}(b - a)\log\left|\dfrac{\sin(x - b)}{\sin(x - a)}\right|$

D. $\sin(b - a)\log\left|\dfrac{\sin(x - a)}{\sin(x - b)}\right|$

Answer: C

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3. $\int \tan^{-1}\left(\sqrt{x}\right)dx = ...$

A. $(x + 1)\tan^{-1}\sqrt{x} - \sqrt{x} + C$

B. $x\tan^{-1}\sqrt{x} - \sqrt{x} + C$

C. $\sqrt{x} - x\tan^{-1}\sqrt{x} + C$

D. $\sqrt{x} - (x + 1)\tan^{-1}\sqrt{x} + C$

Answer: A

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4. $\int \frac{x^9}{\left(4x^2+1\right)^6} dx$

A. $\frac{1}{5x}\left(4+\frac{1}{x^2}\right)^5$

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

C. $\frac{1}{10x}\left(1+4x^2\right)^{-5}$

D. $\frac{1}{10}\left(4+\frac{1}{x^2}\right)^{-5}$

Answer: D

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5. $\int \frac{dx}{(x+2)\left(x^2+1\right)} = a\log\left|1+x^2\right| + b\tan^{-1}x + \frac{1}{5}\log|x+2| + C$ then ... Of the following is true.

a) $a = -\frac{1}{10}, b = -\frac{2}{5}$

b) $a = \frac{1}{10}, b = -\frac{2}{5}$

c) $a = -\frac{1}{10}, b = \frac{2}{5}$

d) $a = \frac{1}{10}, b = \frac{2}{5}$

A. $a = -\frac{1}{10}, b = -\frac{2}{5}$

B. $a = \frac{1}{10}, b = -\frac{2}{5}$

C. $a = -\frac{1}{10}, b = \frac{2}{5}$

D. $a = \frac{1}{10}, b = \frac{2}{5}$

Answer: C

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6. $\int \frac{x^3}{x+1} dx = \ldots . + C$

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

B. $x + \frac{x^2}{2} - \frac{x^3}{3} - \log|1 - x|$

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

D. $x - \frac{x^2}{2} + \frac{x^3}{3} - \log|1 + x|$

Answer: D

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7. $\int \frac{1 + \cos x}{x + \sin x} dx = \ldots + C$

A. $\log|1 + \cos x|$

B. $\log|x + \sin x|$

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

D. $x - \tan\left(\frac{x}{2}\right)$

Answer: D

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8. $\int \frac{x^3}{\sqrt{1 + x^2}} dx = a\left(1 + x^2\right)^{\frac{3}{2}} + b \cdot \sqrt{1 + x^2} + C$

A. $a = \frac{1}{3}$ and $b = 1$

B. $a = -\frac{1}{3}$ and $b = 1$

C. $a = -\frac{1}{3}$ and $b = -1$

D. $a = \frac{1}{3}$ and $b = -1$

Answer: D

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9. $\int_{-\frac{\pi}{4}}^{\frac{\pi}{4}} \frac{1}{1+\cos(2x)}dx = \dots .$

A. 1

B. 2

C. 3

D. 4

Answer: A

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10. $\int_0^{\frac{\pi}{2}} \sqrt{1-\sin(2x)}dx = \dots .$

A. $2\sqrt{2}$

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

C. 2

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

Answer: D

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11. $\int_0^{\frac{\pi}{2}} \cos x \cdot e^{\sin x} dx = \ldots.$

A. $e + 1$

B. $e - 1$

C. e

D. $-e$

Answer: B

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12. $\int\left(\frac{x+3}{(x+4)^2}\right)e^x dx = \ldots.. + C$

A. $e^x\left(\frac{1}{x+4}\right)$

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

C. $e^{-x}\left(\frac{1}{x-4}\right)$

D. $e^{2x}\left(\frac{1}{x-4}\right)$

Answer: A

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13. If $\int_0^a \frac{1}{1+4x^2}dx = \frac{\pi}{8}$ then a=.....

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

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15. $\int_{-\pi}^{\pi} \sin^3 x \cos^2 x dx = \ldots$

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MULTIPLE CHOICE QUESTIONS(MCQS)

1. $\int \left(1 + 2x + 3x^2 + 4x^3 \ldots . \right) dx = \ldots . + c(|x| < 1)$

A. $(1 - x)^{-1}$

B. $(1 - x)^{-1}$

C. $(1 - x)^{-2}$

D. None of these

Answer: B

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

A. $\frac{x^5}{5} - \frac{x^3}{3} + x - 2\tan^{-1}x$

B. $\frac{x^5}{5} + \frac{x^3}{3} + x - 2\tan^{-1}x$

C. $-\frac{x^5}{5} + \frac{x^3}{3} - x - 2\tan^{-1}x$

D. $\frac{x^7}{7} + \frac{x^5}{3} - x - 2\tan^{-1}x$

Answer: A

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3. $\int \frac{\sec 2x - 1}{\sec 2x + 1} dx = ... + c$

A. $\sec^2 - c$

B. $\tan x - x$

C. $\sec^2 x + x$

D. $\tan x + x$

Answer: B

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4.

$$\int \sin x \cdot \cos x \cdot \cos x 2x \cdot \cos 4x \cdot \cos 8x \cdot \cos 16x dx = ... + c$$

A. $\dfrac{\sin 16x}{1024}$

B. $\dfrac{-\cos 32x}{1024}$

C. $\dfrac{\cos 32x}{1096}$

D. $\dfrac{-\cos 32x}{1096}$

Answer: B

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5. $\int f(x)dx = \frac{(\log x)^5}{5} + c$ then $f(x) = ...$

A. $\frac{\log x}{4}$

B. $\frac{(\log x)^4}{x}$

C. $\frac{(\log x)^3}{5}$

D. $\frac{(\log x)^6}{6}$

Answer: B

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6. $\int e^{x\log a} \cdot e^x dx = ... + c$

A. $a^x \cdot e^x$

B. $\dfrac{(ae)^x}{1 + \log a}$

C. $\dfrac{e^x}{\log(ae)}$

D. $\dfrac{a^x}{1 + \log_e a}$

Answer: B

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7. $\int \dfrac{dx}{\cos x - \sin x} = \ldots + c$

A. $\dfrac{1}{\sqrt{2}}\log\left|\tan\left(\dfrac{x}{2} + \dfrac{\pi}{8}\right)\right|$

B. $\dfrac{1}{\sqrt{2}}\log\left|\tan\left(\dfrac{x}{8} + \dfrac{x}{2}\right)\right|$

C. $\dfrac{1}{\sqrt{2}}\log\left|\tan\left(\dfrac{x}{2} - \dfrac{3\pi}{8}\right)\right|$

D. $\log\left|\cos\dfrac{x}{2}\right|$

Answer: A

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8.

$$\int \frac{dx}{(1+\sin x)^{\frac{1}{2}}} = \ldots + c$$

A. $\sqrt{2}\log\left|\tan\left(\frac{3\pi}{8} - \frac{x}{4}\right)\right|$

B. $\sqrt{2}\log\left|\operatorname{cosec}\left(\frac{\pi}{8} + \frac{x}{2}\right) - \cot\left(\frac{\pi}{8} + \frac{x}{2}\right)\right|$

C. $\sqrt{2}\log\left|\tan\left(\frac{\pi}{8} + \frac{x}{4}\right)\right|$

D. $\sqrt{2}\log\left|\sec\left(\frac{\pi}{2} + \frac{x}{4}\right) - \tan\left(\frac{\pi}{2} + \frac{x}{4}\right)\right|$

Answer: C

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9. $\int \sqrt{1 - \sin 2x} dx = \ldots\ldots x \in \left(0, \frac{\pi}{4}\right)$

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

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

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

D. $\sin x + \cos x + c$

Answer: D

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10. If $\int \frac{7^{\frac{1}{x}}}{x^2} dx = m \cdot 7^{\frac{1}{x}}$ then m....

A. $\frac{-1}{\log 7}$

B. $-\log 7$

C. -1

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

Answer: A

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11. If $\int \frac{10x^9 + a10^{x-1}}{x^{10} + 10^x} dx = \log\left(x^{10} + 10^x\right) + c$ then a=......

A. log 10

B. $kog10^2$

C. $\log 10^3$

D. $\log 10^{10}$

Answer: D

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12. If $\frac{1}{f(x)}$ is a anti-derivative of $\log[f(x)]^2 + c$ then f(x)=...

A. x+k

B. $\frac{x^2}{2} + k$

C. $\frac{x}{2} + k$

D. $x^2 + c$

Answer: C

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13. $\int \frac{x^4 + x^2 + 1}{x^2 + 1} dx = \ldots\ldots + c$

A. $\tan^{-1} x + \frac{x^4}{4}$

B. $\frac{x^3}{3} + \tan^{-1} x$

C. $\log\left(x^2 + 1\right)$

D. $\frac{x^3}{3} + \frac{1}{2}\log\left|\frac{x+1}{x-1}\right|$

Answer: B

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14. $\int\sqrt{1-\cos x}dx = \ldots\ldots + c$ where $0 < x < \pi$

A. $-2\sqrt{2}\cos\left(\frac{x}{2}\right)$

B. $-\sqrt{2}\cos\left(\frac{x}{2}\right)$

C. $-\frac{1}{2}\cos\left(\frac{x}{2}\right)$

D. $2\cos\left(\frac{\sqrt{2}x}{2}\right)$

Answer: A

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15. $\int \frac{dx}{\sin x + \sqrt{3} + \cos x} = ...$

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

B. $\frac{1}{2}\log\left|\tan\left(\frac{x}{2} + \frac{\pi}{6}\right)\right|$

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

D. $\frac{1}{2}\log\left|\cot\left(\frac{x}{2} + \frac{\pi}{6}\right)\right|$

Answer: B

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16. $\int \frac{\sin 2x}{\sin 5x \cdot \sin 3x} dx = \ldots. + c$

A. $\log|\sin 3x| - \log|\sin 5x|$

B. $\frac{1}{3}\log|\sin x 3x| + \frac{1}{5}|\sin 5x|$

C. $\frac{1}{3}\log|\sin x 3x| - \frac{1}{5}|\sin 5x|$

D. $3\log|\sin 3x| - 5\frac{1}{5}\log|\sin 5x|$

Answer: C

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17. $\int 5^{x+1} \cdot e^{2x-1}dx = \ldots. + c$

A. $\frac{5^{x+1} \cdot e^{2x-1}}{\log 5}$

B. $\frac{5^{x+1} \cdot e^{2x-1}}{\log 5e}$

C. $\frac{5^{x+1} \cdot e^{2x-1}}{\log 5 + 2}$

D. $\frac{5^{x+1} \cdot e^{2x}}{5e}$

Answer: C

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18. $\int \sin^{-1}(\cos x)dx = ...$

A. $\dfrac{\pi x}{2}$

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

C. $\dfrac{\pi x - x^2}{2}$

D. $\dfrac{\pi x + x^2}{2}$

Answer: C

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19. $\int \dfrac{dx}{\tan x + \cot x} = ...$

A. $\dfrac{\cos 2x}{4} + c$

B. $\dfrac{\sin 2x}{4} + c$

C. $-\dfrac{\sin 2x}{4} + c$

D. $-\frac{\cos 2x}{4} + c$

Answer: D

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20. If $f'(x) = x^2 + 5$ and $f(0) = -1$ then f(x)=...

A. $x^3 + 5x - 1$

B. $x^3 + 5x + 1$

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

D. $\frac{1}{3}x^3 + 5x + 1$

Answer: C

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21. If $\int(\sin 2x - \cos 2x)dx = \frac{1}{\sqrt{2}}\sin(2x - a) + b$ then .....

A. $a = \frac{\pi}{4}, b = 0$

B. $a = -\frac{\pi}{4}, b = 0$

C. $a = \frac{5\pi}{4}, b =$ Any constant

D. $a = -\frac{5\pi}{4}, b =$ Any constant

Answer: D

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22. $\int(\sec x + \tan x)^2 dx = \ldots$

A. $2(\sec x + \tan x) - x + c$

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

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

D. $2(\sec x + \tan x) + c$

Answer: A

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23. $\int x^{51}\left(\tan^{-1}x + \cot^{-1}x\right)dx = ...$

A. $\frac{x^{52}}{52}\left(\tan^{-1}x + \cot^{-1}x\right) + c$

B. $\frac{x^{52}}{52}\left(\tan^{-1}x - \cot^{-1}x\right) + c$

C. $\frac{\pi x^{52}}{104} + \frac{\pi}{2} + c$

D. $\frac{x^{52}}{52} + \frac{\pi}{2} + c$

Answer: A

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

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

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

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

D. None of these

Answer: A

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25. If $\int \frac{dx}{1 + \sin x} = \tan\left(\frac{x}{2} + a\right) + b$, then..

A. $a = \frac{\pi}{4}, b = 3$

B. $a = -\frac{\pi}{4}, b = 3$

C. $a = \frac{\pi}{4}, b =$ Arbitary constant

D. $a = -\frac{\pi}{4}, b =$ Arbitary constant

Answer: D

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26. Find the integrals of the functions

$$\frac{\cos 2x + 2\sin^2 x}{\cos^2 x}$$

A. $2\sec x + c$

B. $2\tan x + c$

C. $\tan x + c$

D. None of these

Answer: C

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27. $\int \frac{5\left(x^6+1\right)}{x^2+1}dx = ...$

A. $5\left(x^7+x\right)\tan^{-1}x + c$

B. $x^5 - \frac{5}{3}x^3 + 5x + C$

C. $3x^4 - 5x^2 + 15x + c$

D. $5\tan^{-1}\left(x^2+1\right)dx = ...\,.$

Answer: B

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28. $\int \frac{dx}{\sin x + \sqrt{3} + \cos x} = ...$

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

B. $\frac{1}{2}\log\tan\left(\frac{x}{2}+\frac{\pi}{6}\right) + c$

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

D. $\frac{1}{2}\log\cot\left(\frac{x}{2}+\frac{\pi}{6}\right)+c$

Answer: B

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

A. $\frac{1}{3}\log[\sec 6x + \tan 6x] + c$

B. $\frac{1}{6}\log[\sec 6x + \tan 6x] + c$

C. $\log[\sec 6x + \tan 6x] + c$

D. None of these

Answer: B

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30. If $\int \frac{f(x)dx}{\log\sin x} = \log\sin x$, then $f(x) = ...$

A. $\sin x$

B. $\cos x$

C. $\log\sin x$

D. $\cot x$

Answer: D

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31. $\int \{1 + 2\tan x(\tan x + \sec x)\}^{\frac{1}{2}} dx = ...$

A. $\log(\sec x + \tan x) + c$

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

C. $\log\sec x(\sec x + \tan x) + c$

D. None of these

Answer: C

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32. $\int \frac{1 - \tan x}{1 + \tan x} dx = \ldots .$

A. $\log \sec\left(\frac{\pi}{4} - x\right) + c$

B. $\log \sec\left(\frac{\pi}{4} + x\right) + c$

C. $\log \sin\left(\frac{\pi}{4} + x\right) + c$

D. None of these

Answer: C

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33. If $\int f(x)dx = f(x)$, then $\int [f(x)]^2 dx = \ldots$

A. $\frac{1}{2}[f(x)]^2$

B. $[f(x)]^3$

C. $\frac{[f(x)]^3}{3}$

D. $[f(x)]^2$

Answer: A

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34. If $\int \sqrt{2}\sqrt{1+\sin x}dx = -4\cos(ax+b)+c$ then the value of (a,b) is....

A. $\frac{1}{2}, \frac{\pi}{4}$

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

C. $1, 1$

D. None of these

Answer: A

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

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

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

C. $-\sin^{-1}\sqrt{x}+c$

D. $\sin^{-1}\sqrt{x}+c$

Answer: B

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

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

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

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

D. None of these

Answer: A

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37. $\int\left(x - 11C_1x^2 + 11C_2x^3 - 11C_3x^4 + \dots - 11C_{11}x^{12}\right)dx = \dots$

A. $\frac{(1-x)^{12}}{12} - \frac{(1-x)^{11}}{11} + c$

B. $\frac{(1-x)^{13}}{12} - \frac{(1-x)^{12}}{12} + c$

C. $\frac{(1-x)^{11}}{11} - \frac{(1-x)^{12}}{12} + c$

D. $\frac{(1-x)^{12}}{12} - \frac{(1-x)^{13}}{12} + c$

Answer: B

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38. $\int \frac{x}{\sqrt{1 + x^2 + \sqrt{\left(1 + x^2\right)^3}}} dx = ... + c$

A. $\frac{1}{2}\log\left| + \sqrt{1 + x^2}\right|$

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

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

D. None of these

Answer: B

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39. $\int \frac{\log|x|}{x\sqrt{1 + \log|x|}} dx = ... + c.$

A. $\frac{2}{3}\sqrt{1 + \log|x|}(\log|x| - 5)$

B. $\frac{2}{3}\sqrt{1 + \log|x|}(\log|x| - 2)$

C. $\frac{1}{3}\sqrt{1 + \log|x|}(\log|x| - 2)$

D. $2\sqrt{1 + \log|x|}(\log|x| - 2)$

Answer: B

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40. $\int \frac{e^x\left(1 - nx^{n-1} - x^{2n}\right)}{\left(1 - x^n\right)\sqrt{1 - x^{2n}}}d = ... + c$

A. $e^x\sqrt{\frac{1 - x^n}{1 + x^n}}$

B. $e^x\sqrt{\frac{1 + x^n}{1 - x^n}}$

C. $e^{-x}\sqrt{\frac{1 - x^n}{1 + x^n}}$

D. None of these

Answer: B

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41. $\int x^x(1 + \log x)dx = ... + c$

A. $x^x \log x$

B. e^{x^x}

C. x^x

D. None of these

Answer: C

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42. f(x) is a continuous and differentiable function.

$f'(x) \neq 0$ and $\begin{vmatrix} f'(x) & f(x) \\ f''(x) & f'(x) \end{vmatrix} = 0$. If f(0)=1 and f'(0)=2 then f(x)=....

A. $x^2 + x + 1$

B. $2e^x - 1$

C. e^{2x}

D. $4e^{\frac{x}{2}} - 3$

Answer: C

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43. For continuous function $f, f'\left(\log_e(x)\right) = \begin{cases} 1 & 0 < x \leq 1 \\ x, & x > 1 \end{cases}$. then f(x)=.....

A. $f'(x) = \begin{cases} 1, & x \leq 0 \\ e^1 - 1, & x > 1 \end{cases}$

B. $f(x) = \begin{cases} 1, & x \leq 0 \\ e^1 - 1, & x > 1 \end{cases}$

C. $f(x) = \begin{cases} x, & x < 0 \\ e^x, & x > 1 \end{cases}$

D. $f(x) = \begin{cases} x, & x < 0 \\ e^x - 1, & x > 1 \end{cases}$

Answer: D

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44. $\int\left(\pi_{r=i}^{n}(x+r)\right)\left(\sum_{k=1}^{n}\frac{1}{x+k}\right)dx=\ldots.$

A. $\sum_{r=i}^{n}(x+r)$

B. $\sum_{r=i}^{n}\frac{1}{x+k}$

C. $\sum_{r=i}^{n}\log(x+r)$

D. None of these

Answer: A

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45. $\int \frac{dx}{x^r\left(1+x^r\right)^{\frac{1}{r}}} = I, r \in N$ and $I = \alpha\left(1+x^3\right)^{\beta}$ then the euation whose does are α and β is ....

A. $6x^2 - x - 2 = 0$

B. $6x^2 - x + 2 = 0$

C. $6x^2 + x - 2 = 0$

D. $6x^2 + x + 2 = 0$

Answer: A

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46. If $\int \frac{\left(\sqrt{x}\right)^5}{\left(\sqrt{x}\right)^7 + x^6} dx = a\log\left(\frac{x^k}{x^k+1}\right) + c$

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

B. '=1/5 , 2/5`

C. < 2

D. $= 1$

Answer: B

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47. $\int \frac{x^{\frac{1}{2}}}{\sqrt{1 - x^3}} dx = \frac{2}{3} gof(x) + c$ then....

A. $f(x) = \sqrt{x} g(x) = \sin^{-1} x$

B. $f(x) = x^{\frac{3}{2}}, \frac{g}{x} = \sin x$

C. $f(x) = x^{\frac{3}{2}}, \frac{g}{x} = \sin^{-1} s x$

D. $f(x) = x^{\frac{3}{2}} g(x) = \sin^{-1} x$

Answer: D

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48. $\int \frac{\sec x dx}{\sqrt{\cos 2x}} = \ldots$

A. $\sin^{-1}(\tan x)$

B. $\tan x$

C. $\cos^{-1}(\tan x)$

D. $\frac{\sin x}{\sqrt{\cos x}}$

Answer: A

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49. $\int \frac{x dx}{1 - x\cot x} = \ldots.$

A. $\log(\cos x - x\sin x) + c$

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

C. $\log(\sin x - x\cos x) + c$

D. None of these

Answer: C

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50. Integrate the following functions :

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

A. $\log\left(x^e + e^x\right) + c$

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

C. $\frac{1}{e}\log\left(x^e + e^x\right) + c$

D. None of these

Answer: C

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51. Integrate the following functions :

$$\int \frac{3x^2}{1+x^6}dx$$

A. $\log\left(x^6+1\right)+c$

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

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

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

Answer: B

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52. $\int \frac{x-2}{x(2\log x - x)}dx = \ldots.$

A. $\log(2\log x - x)+c$

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

C. $\log(x-2\log x)+c$

D. $\log\left(\frac{1}{x - 2\log x}\right) + c$

Answer: B

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53. $\int\sqrt{1 + x^2}dx = \ldots$

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

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

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

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

Answer: D

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54. $\int \frac{x+1}{\sqrt{1+x^2}}dx = \ldots$

A. $\sqrt{1+x^2} + \tan^{-1}x + c$

B. $\sqrt{1+x^2} - \log\left[x + \sqrt{1+x^2}\right] + c$

C. $\sqrt{1+x^2} + \log\left[x + \sqrt{1+x^2}\right] + c$

D. $\sqrt{1+x^2} + \log(\sec x + \tan x) + c$

Answer: C

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55. $\int \frac{e^{2x}-1}{e^{2x}+1}dx = \ldots$

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

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

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

D. None of these

Answer: B

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56. $\int \frac{1}{\left(e^{x}+e^{-x}\right)^{2}} dx = \ldots .$

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

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

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

D. None of these

Answer: A

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57. $\int \frac{e^{-x}}{1+e^{x}} dx = ...$

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

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

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

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

Answer: A

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58. $\int \frac{1}{\sqrt{1-e^{2x}}} dx = ...$

A. $x - \log\left[1+\sqrt{1-e^{2x}}\right] + c$

B. $x + \log\left[1+\sqrt{1-e^{2x}}\right] + c$

C. $\log\left[1+\sqrt{1-e^{2x}}\right] + c$

D. None of these

Answer: A

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59. $\int \frac{1}{x^3}\left[\log x^x\right]^2 dx = \ldots$

A. $\frac{x^3}{3}(\log x) + x + c$

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

C. $3\log(\log x) + c$

D. None of these

Answer: B

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60. $\int \frac{dx}{x\log x\log(\log x)} = \ldots$

A. $2\log(\log x) + c$

B. $\log[\log(\log x)] + c$

C. $\log(x\log x) + c$

D. None of these

Answer: B

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61. $\int \frac{2x\tan^{-1}x^2}{1 + x^4}dx = \ldots$

A. $\left[\tan^{-1}x^2\right]^2 + c$

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

C. $2\left[\tan^{-1}x^2\right] + c$

D. None of these

Answer: B

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62. $\int \frac{x^5 dx}{\sqrt{\left(1+x^3\right)}} = \ldots$

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

B. $\frac{2}{9}\sqrt{\left(1+x^3\right)\left(x^3-4\right)}$

C. $\frac{2}{9}\sqrt{\left(1+x^3\right)\left(x^3+4\right)}$

D. $\frac{2}{9}\sqrt{\left(1+x^3\right)\left(x^3-2\right)}$

Answer: D

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

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

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

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

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

Answer: A

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64. $I = \int \frac{dx}{\left(1+e^x\right)\left(1+e^{-x}\right)} = ...$

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

B. $\frac{e^x}{1+e^x}$

C. $\dfrac{1}{1+e^{x}}$

D. None of these

Answer: A

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65. $\int \dfrac{dx}{2\sqrt{x}(1+x)} = \ldots$

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

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

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

D. None of these

Answer: B

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66. If $\int \frac{1}{x + x^5} dx = f(x) + c$, then the value of $\int \frac{x^4}{x + x^5} dx = \ldots.$

A. $\log x - f(x) + c$

B. $f(x)\log x + c$

C. $f(x) - \log x + c$

D. None of these

Answer: A

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67. $\int \frac{1 + x^2}{\sqrt{1 - x^2}} dx = \ldots$

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

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

C. $\frac{3}{2}\cos^{-1}e - \frac{1}{2}x\sqrt{1 - x^2} + c$

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

Answer: A

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68. $\int \frac{1}{\left[(x - 1)^3(x + 2)^5\right]^{\frac{1}{4}}} dx = ...$

A. $\frac{4}{3}\left(\frac{x - 1}{x + 2}\right)^{\frac{1}{2}} + c$

B. $\frac{4}{3}\left(\frac{x + 2}{x - 1}\right)^{\frac{1}{4}} + c$

C. $\frac{1}{3}\left(\frac{x - 1}{x + 2}\right)^{\frac{1}{4}} + c$

D. $\frac{1}{3}\left(\frac{x + 2}{x - 1}\right)^{\frac{1}{4}} + c$

Answer: A

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69. $\int \frac{1}{(1+x)\sqrt{x}} dx = f(x) + c$ then f(x)=.....

A. $2\tan^{-1}x$

B. $2\tan^{-1}\sqrt{x}$

C. $2\cot^{-1}\sqrt{x}$

D. $\log_e^{(1+x)}$

Answer: A

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70. $\int \frac{\log\left(x+\sqrt{1+x^2}\right)}{\sqrt{1+x^2}} dx = ... + c$

A. $\frac{1}{2}\left[\log\left(x+\sqrt{1+x^2}\right)\right]^2$

B. $\log\left[x+\sqrt{1+x^2}\right]^2$

C. $\log\left(x+\sqrt{1+x^2}\right)$

D. None of these

Answer: A

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71. $\int \frac{1}{x^2\left(x^4+1\right)^{\frac{3}{4}}}dx = .. + c$

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

B. $\left(x^4+1\right)^{\frac{1}{4}}$

C. $\left(1-\frac{1}{x^4}\right)^{\frac{1}{4}}$

D. $-\left(1+\frac{1}{x^4}\right)^{\frac{1}{4}}$

Answer: D

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72. $\int \frac{x^{\frac{1}{2}}}{\sqrt{1-x^3}}dx = \frac{2}{3}gof(x) + c$ then....

A. $f(x) = \sqrt{x}g(x) = \sin^{-1}x$

B. $f(x) = x^{\frac{3}{2}}, g(x) = \sin x$

C. $f(x) = x^{\frac{2}{3}}, g(x) = \sin^{-1}x$

D. $f(x) = x^{\frac{3}{2}}, g(x) = \sin^{-1}x$

Answer: D

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

A. $\sin^{-1}\sqrt{x} + c$

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

C. $-\sin^{-1}\sqrt{x} + c$

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

Answer: B

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74. $\int\left(\frac{1}{\sqrt{x + 2} - \sqrt{x}}\right)dx = \ldots. + c$

A. $\frac{3}{2}(x + 2)^{\frac{3}{2}} + \frac{2}{3}x^{\frac{3}{2}}$

B. $\frac{3}{2}(x + 2)^{\frac{1}{2}} + \frac{2}{9}x^{\frac{1}{2}}$

C. $\frac{3}{2}(x + 2)^{\frac{3}{2}} + \frac{2}{9}x^{\frac{3}{2}}$

D. $\frac{2}{9}(x + 2)^{\frac{3}{2}} + \frac{2}{9x}$

Answer: D

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75. $\int \sqrt{\frac{a - x}{a + x}} dx = ... + c$

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

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

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

D. $a\sin^{-1}\left(\frac{x}{a}\right) - \sqrt{a^2 - x^2}$

Answer: D

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

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

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

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

D. $\frac{1}{\sqrt{2}}\tan^{-1}\left(\frac{x^2-1}{\sqrt{2x}}\right)$

Answer: B

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77. Find $\int\left[\sqrt{\cot x}+\sqrt{\tan x}\right]dx$

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

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

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

D. $\frac{\tan x}{\sqrt{2}}\tan^{-1}\left(\frac{\cot x-1}{\sqrt{2\tan x}}\right)$

Answer: B

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78. $\int\left(e^{ex\log_e x}+\left(\log_e x\right)\left(e^{ex\log_e x}\right)\right)dx = \ldots + c$

A. $\frac{x^{-ex}}{e}$

B. $\frac{x^{ex}}{e}$

C. $-\frac{x^{ex}}{e}$

D. $\log(x \cdot e)$

Answer: B

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79. $\int\frac{(x-1)^2}{\left(x^2+1\right)^2}dx = \tan^{-1}x + f(x) + c$ then f(x)=....

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

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

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

D. None of these

Answer: C

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80. $\int \frac{1}{e^x+1} dx = ...$

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

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

C. $\log\left(1+e^x\right) + c$

D. $\log\left(1-e^x\right) + c$

Answer: A

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81. $\int \frac{x^3 + 4x - 3}{x^2 + 4} dx = Ax^2 + B\tan^{-1}\frac{x}{2} + c$ then $A + B = \ldots$ where $A, B \in R$

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

B. -1

C. 2

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

Answer: B

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82. Integration using trigonometric identities :

$\int \frac{\cos^8 x - \sin^8 x}{1 - 2\sin^2 x\cos^2 x} dx = \ldots + c$

A. $-\frac{\sin 2x}{2}$

B. $\frac{\sin 2x}{2}$

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

D. $\frac{\cos 2x}{2}$

Answer: B

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83. If Integration using rigonometric identities :

$$\int \frac{dx}{\sqrt{\sin^3 x(\sin x + 2\cos x)}} = f(x) + c \text{ then } f\left(\frac{\pi}{4}\right) = ...$$

A. - 1

B. - $\sqrt{2}$

C. - $\sqrt{3}$

D. - 2

Answer: C

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84. Integration using rigonometric identities :

$\frac{d}{dx}g(x) = g(x)$ and $g(0) = 1$ then $\int g(x)\left(\frac{2 - \sin 2x}{1 - \cos 2x}\right)dx.... + c$

A. $g(x)\cot x$

B. $-g(x)\cot x$

C. $\frac{g(x)}{1 - \cos 2x}$

D. None of these

Answer: B

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85. Integration using rigonometric identities :

$\int \frac{\sin\theta}{\cos 3\theta} + \frac{\sin 3\theta}{\cos 9\theta} + \frac{\sin 9\theta}{\cos 27\theta} d\theta = ... + c$

A. $\frac{1}{2}\log\left|\frac{\sec 27\theta}{\sec\theta}\right|$

B. $\frac{1}{2}\log\left|\frac{\sec\theta}{\sec 27\theta}\right|$

C. $\frac{1}{2}\log\left|\sqrt{\frac{\sec\theta}{\sec 27\theta}}\right|$

D. None of these

Answer: C

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86. Integration using rigonometric identities :

$\int \sin(101x) \cdot \sin^{99} x dx = \ldots + c$

A. $\frac{\sin(100x) \cdot (\sin x)^{100}}{100}$

B. $\frac{\cos(100x) \cdot (\cos x)^{100}}{100}$

C. $\frac{\cos(100x) \cdot (\cos x)^{100}}{100}$

D. $\frac{\sin(100x) \cdot (\sin x)^{100}}{101}$

Answer: A

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87. Integration using rigonometric identities :

$\int \sin 4x \cdot e^{\tan^2 x} dx = a\cos^b x \cdot e^{\tan^2 x} + c$ then the value of a^{2a} is ....

A. 256

B. 265

C. 285

D. 156

Answer: A

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88. Integration using trigonometric identities :

$$\int \frac{d\theta}{\sin\theta \cdot \cos^3\theta} = ... + c$$

A. $\log\tan\theta + \tan^2\theta$

B. $\log\tan\theta - \frac{1}{2} + \tan^2\theta$

C. $\log\tan\theta + \frac{1}{2}\tan^2\theta$

D. None of these

Answer: C

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89. Integration using rigonometric identities :

$$\int \frac{\sin 2x}{\sin^4 x + \cos^4 x} dx = ...$$

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

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

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

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

Answer: B

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90. Integration using rigonometric identities :

$\int \cos^5 x dx = ...$

A. $\sin x - \frac{2}{3}\sin^3 x + \frac{1}{5}\sin^5 x + c$

B. $\sin x + \frac{2}{3}\sin^3 + \frac{1}{5}\sin^5 x + c$

C. $\sin x - \frac{2}{3}\sin^3 x - \frac{1}{5}\sin^5 + c$

D. None of these

Answer: A

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91. Integration using rigonometric identities :

$\int \sec x \tan^3 x dx = ...$

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

B. $\sec^3 x - \sec x + c$

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

D. None of these

Answer: A

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92. Integration using trigonometric identities :

$\int \tan^4 x dx = ...$

A. $\tan^3 x - \tan x + x + c$

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

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

D. $\frac{1}{3}\tan^3 x + \tan x + x + c$

Answer: B

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93. $\int \frac{\sin 2x}{\sin 5x \cdot \sin 3x} dx = \ldots . \; + c$

A. $\log\sin 3x - \log\sin 5x + c$

B. $\frac{1}{3}\log\sin 3x + \frac{1}{5}\log\sin 5x + c$

C. $\frac{1}{3}\log\sin 3x - \frac{1}{5}\log\sin 5x + c$

D. $3\log\sin 4x - 5\log\sin 5x + c$

Answer: C

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94. Integration using trigonometric identities :

$\int \sec^4 x \tan x dx = ...$

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

B. $4\sec^4 x + c$

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

D. $3\sec^3 x + c$

Answer: A

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95. Integrate the following functions :

$\int \frac{1 + \tan x}{x + \log\sec x} dx$

A. $\log(x + \log\sec x) + c$

B. $-\log(x + \log\sec x) + c$

C. $\log(x - \log\sec x) + c$

D. None of these

Answer: A

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96. Integration using trigonometric identities :

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

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

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

C. $-\frac{1}{\sqrt{2}}\tan^{-1}\left(\sqrt{2}\tan x\right) + k$

D. $-\sqrt{2}\tan^{-1}\left(\sqrt{2}\tan x\right) + k$

Answer: A

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97. $\int \frac{\sin^3 2x}{\cos^5 2x} dx = \ldots$

A. $\tan^4 x + c$

B. $\tan 4x + c$

C. $\tan^4 2x + x + c$

D. $\frac{1}{8}\tan^4 2x + c$

Answer: D

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98. $\int \frac{1 + \tan^2 x}{1 - \tan^2 x} dx = \ldots.$

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

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

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

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

Answer: D

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99. $\int \frac{\cos 4x + 1}{\cos x - \tan x} dx = k \cos 4x + c$ then.....

A. $k = -\frac{1}{2}$

B. $k = -\frac{1}{8}$

C. $k = -\frac{1}{4}$

D. None of these

Answer: B

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100. Integration using rigonometric identities :

$$\int \frac{(\sin\theta + \cos\theta)}{\sqrt{\sin 2\theta}} d\theta = \ldots .$$

A. $\log\left|\cos\theta - \sin\theta + \sqrt{\sin 2\theta}\right|$

B. $\log\left|\sin\theta - \cos\theta + \sqrt{\sin\theta}\right|$

C. $\sin^{-1}(\sin\theta - \cos\theta) + c$

D. $\sin^{-1}(\sin\theta + \cos\theta) + c$

Answer: C

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101. $\int \sec^{\frac{2}{3}} x \cdot \operatorname{cosec}^{\frac{4}{3}} x dx = \ldots .$

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

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

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

D. $(\tan x)^{-\frac{1}{3}} + c$

Answer: B

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102. If Integration using rigonometric identities :

$\int \frac{\sec^2 x}{(1 + \tan x)(2 + \tan x)} dx$ we can take .... As substitution.

A. $1 + \tan x = t$

B. $2 + \tan x = t$

C. $\tan x = t$

D. None of these

Answer: C

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103. Integration using rigonometric identities :

$$\int \tan x \cdot \sec^2 x\sqrt{1 - \tan^2 x}dx = ...$$

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

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

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

D. None of these

Answer: A

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104. Integration using rigonometric identities :

$$\int \cos^{-\frac{3}{7}} x \sin^{-\frac{11}{7}} x dx = ...$$

A. $\log\left|\sin^{\frac{4}{7}} x\right| + c$

B. $\frac{4}{7}\tan^{\frac{4}{7}} x + c$

C. $-\frac{7}{4}\tan^{\frac{4}{7}}x + c$

D. $\log\left|\cos^{\frac{3}{7}}x\right| + c$

Answer: C

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105. $\int \sec^2 x \cdot \operatorname{cos}ec^2(x)dx = \ldots.\ + c$

A. $\tan x + \cot x$

B. $\tan x - \cot x$

C. $\sec^2 x + \operatorname{cosec}^2 x$

D. $\cot x - \tan x$

Answer: B

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106. $\int \frac{(\sin x)^{99}}{(\cos x)^{101}} dx = ... + c$

A. $\frac{(\tan x)^{100}}{100}$

B. $\frac{(\tan x)^{2}}{100}$

C. $\frac{(\tan x)^{98}}{98}$

D. $\frac{(\tan x)^{97}}{97}$

Answer: A

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107. Integration using rigonometric identities :

$$\int \frac{x\sin x}{(x\cos x - \sin x + 5)} dx = ... + c$$

A. $\log|x\cos x - \sin x + 5|$

B. $-\log|x\cos x - \sin x + 5|$

C. $\log|x\sin x - \sin x + 5|$

D. $-\log|x\sin x - \sin x + 5|$

Answer: B

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108. $\int(1 - \cos x)\operatorname{cos}ec^2 x dx = \ldots. \ + c$

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

B. $\cot\left(\frac{x}{2}\right)$

C. $\frac{1}{2}\tan\left(\frac{x}{2}\right)$

D. $2\tan\left(\frac{x}{2}\right)$

Answer: A

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109. If Integration using trigonometric identities :

$\int \sin 2x \cdot \cos 3x dx = A\cos x + B\cos 5x + c$ then $A + B = ...$

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

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

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

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

Answer: D

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110. If Integration using rigonometric identities :

$\int \frac{\cos 4x + 1}{\cot x - \tan x} dx = A\cos 4x + c$ then A=....

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

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

C. $-\frac{1}{8}$

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

Answer: C

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111. Integration using rigonometric identities :

$$\int \frac{1+\cos x}{\sin x \cos x} dx = \text{....} + c$$

A. $\log|\sin x| + \log|\cos x|$

B. $\log\left|\tan x \cdot \tan\left(\frac{x}{2}\right)\right|$

C. $\log\left|1 + \tan\left(\frac{x}{2}\right)\right|$

D. $\log\left|\sec\left(\frac{x}{2}\right) + \tan\left(\frac{x}{2}\right)\right|$

Answer: B

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112. Integration using rigonometric identities :

$$\int \frac{\sin x \cos x}{\sqrt{3+5\sin^2 x}}dx = \ldots + c$$

A. $\frac{1}{5}\sqrt{3+5\sin^2 x}$

B. $\frac{1}{10}\sqrt{3+5\sin^2 x}$

C. $\frac{1}{20}\sqrt{3+5\sin^2 x}$

D. $\frac{1}{2\sqrt{3}}\sqrt{3+5\sin^2 x}$

Answer: A

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113. If Integration using rigonometric identities :

$$\int \frac{1}{1+\cot x}dx = px + q$$

A. $p = \frac{1}{2}, q = \frac{1}{2}$

B. $p = -\frac{1}{2}, q = \frac{1}{2}$

C. $p = -\frac{1}{2}, q = -\frac{1}{2}$

D. $p = \frac{1}{2}, q = -\frac{1}{2}$

Answer: D

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114. If Integration using trigonometric identities :

$\int \frac{\cos 8x + 1}{\tan 2x - \cot 2x} dx = a\cos 8x + c$ then a = ...

A. $-\frac{1}{16}$

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

C. $\frac{1}{16}$

D. $-\frac{1}{8}$

Answer: C

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115. Integration using rigonometric identities :

$$\int \frac{\sin x - \cos x}{x^2 + x\sin x} dx = ... + c$$

A. $\log|x + \sin x|$

B. $\log\left|\frac{x}{x + \sin x}\right|$

C. $\log\left|x^2 + x\sin x\right|$

D. $\log\left|\frac{x + \sin x}{x}\right|$

Answer: B

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116. Integration of some particular functions :

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

A. $\frac{1}{2}\left[\sin^{-1}x + \sqrt{1 - x^4}\right.$

B. $\frac{1}{2}\left[\sin^{-1}x + \sqrt{1 - x^4}\right.$

C. $\sin^{-1}x^2 + \sqrt{1 - x^4}$

D. $\sin^{-1}x^2 + \sqrt{1 - x^4}$

Answer: B

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117. Integration of some particular functions :

$$\int \frac{x - 2}{x^2 - 4x + 5}dx = \ldots\ldots + c$$

A. $\log\left|x^2 - 4x + 5\right|$

B. $\log\sqrt{x^2 - 4x + 5}$

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

D. $\log\left(\frac{x - 3}{x - 1}\right)$

Answer: B

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118. Integration of some particular functions :

$$\int \frac{dx}{5 - 4\cos x} = ... + c$$

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

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

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

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

Answer: D

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119. Integration of some particular functions :

$$\int \frac{\sin 2x}{p\cos^2 x + q\sin^2 x} dx = \ldots . \ + c$$

A. $\frac{q}{p}\log|p\sin 2x + q\cos 2x|$

B. $(q - p)\log\left|p\cos^2 x + q\sin^2 x\right|$

C. $\frac{1}{q - p}\log\left|p\cos^2 x + q\sin^2 x\right|$

D. $\frac{1}{p^2 + q}\log\left|p\cos^2 x + q\sin^2 x\right|$

Answer: C

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120. Integration of some particular functions :

$$\int \frac{\tan x}{4 + 9\tan^2 x} dx = \ldots . x + c$$

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

B. $\frac{1}{10}\log\left|4 + 9\tan^2 x\right|$

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

D. $\frac{1}{10}\log\left|4\cos^2 + 9\sin^2 x\right|$

Answer: D

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121. Integration of some particular functions :

$$\int \frac{e^x}{e^{2x} + e^x + 1}dx = \ldots.. \ + c$$

A. $\frac{1}{\sqrt{3}}\sec^{-1}\left(\frac{2e^x + 1}{\sqrt{3}}\right)$

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

C. $\frac{2}{\sqrt{3}}\tan^{-2}\left(\frac{2e^x + 1}{\sqrt{3}}\right)$

D. $\frac{1}{\sqrt{3}}\tan^{-2}\left(\frac{e^x + 1}{\sqrt{3}}\right)$

Answer: C

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122. Integration of some particular functions :

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

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

B. $\sin^{-1}\left(\frac{2x - 1}{\sqrt{15}}\right)$

C. $\sin^{-1}\left(\frac{2x + 3}{\sqrt{17}}\right)$

D. $\sin^{-1}\left(\frac{3 + 2x}{3\sqrt{2}}\right)$

Answer: C

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123. Integration of some particular functions :

$$\int \frac{dx}{\sqrt{\left(\log \frac{1}{2}\right)^2 - x^2}} dx = ... + c$$

A. $\sin^{-1}\left(\frac{x}{\log 2}\right)$

B. $\sin^{-1}\left(\frac{x}{\frac{\log(1)}{2}}\right)$

C. $\cos^{-1}\left(\frac{x}{\log 2}\right)$

D. $\cos^{-1}\left(\frac{\log 2}{x}\right)$

Answer: A

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124. Integration of some particular functions :

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

A. $\log\sqrt{x^2 - 4x + 3}$

B. $x\log(x - 3)\log(x - 2)$

C. $\log(x - 3)(x - 1)$

D. $\log\left(x^2 + 4x + 3\right)$

Answer: A

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125. Integration of some particular functions :

$$\int \frac{dx}{\sqrt{25 - 9x^2}} = ... + c$$

A. $\sin^{-1}\left(\frac{3x}{5}\right)$

B. $\frac{1}{5}\sin^{-1}\left(\frac{3x}{5}\right)$

C. $\frac{1}{3}\sin^{-1}\left(\frac{3x}{5}\right)$

D. $\log\left|25 - 9x^2\right|$

Answer: C

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126. Integration of some particular functions :

$$\int \frac{dx}{\sqrt{25 + 9x^2}} = \ldots\ldots + c$$

A. $\sin^{-1}\left(\frac{3x}{5}\right)$

B. $\frac{1}{3}\sin^{-1}\left(\frac{3x}{5}\right)$

C. $\frac{1}{3}\log\left|3x - \sqrt{25 + 9x^2}\right| + c$

D. $\frac{1}{3}\log\left|3x - \sqrt{25 + 9x^2 + 25}\right| + c$

Answer: D

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127. Integration of some particular functions :

$$\int \frac{dx}{\sqrt{x^2 - 6x + 9}} = \ldots\ldots + c \text{ where } x \in (-\infty, 3)$$

A. $-\log|x - 3|$

B. $\log|x - 3|$

C. $\log(x - 3)$

D. $\log(3 - x)$

Answer: A

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128. Integration of some particular functions :

$$\int \frac{dx}{\sqrt{x^2 - 2x + 3}} = \dots + c$$

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

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

C. $\log\left|x - 1 + \sqrt{x^2 - 2x + 3}\right| + c$

D. $\log\left|x - 1 - \sqrt{x^2 - 2x + 3}\right| + c$

Answer: C

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129. Integration of some particular functions :

$$\int \frac{x^4 + 3x^2 + 1}{x^2 + 3}dx = \dots. + c$$

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

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

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

D. $\frac{x^3}{3} + \tan^{-1}\left(\frac{x}{\sqrt{3}}\right)$

Answer: C

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130. Integration of some particular functions :

$$\int \frac{dx}{\sqrt{21 + 12x - 9x^2}} = \ldots + c$$

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

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

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

D. $\frac{1}{15}\sin^{-1}\left(\frac{3x - 2}{5}\right)$

Answer: C

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131. Integration of some particular functions :

$$\int \frac{2x}{\sqrt{x^2 - 2x + 7}} dx = ... \ + c$$

A. $2\sqrt{x^2 - 2x + 7} + 2\log\left|x - 1 + \sqrt{x^2 - 2x + 7}\right|$

B. $2\log\left|x^2 - 2x + 7\right| + 2\log\left|x - 1 + \sqrt{x^2 - 2x + 7}\right|$

C. $2\sqrt{x^2 - 2x + 7} + 9\log\left|x - 1 + \sqrt{x^2 - 2x + 7}\right|$

D. $\log\left|x - 1 + \sqrt{x^2 - 2x + 6}\right|$

Answer: A

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132. Integration of some particular functions :

$$\int \frac{1}{3t^2 + 4} dt = A\tan^{-1}(Bt) + c \text{ then AB=....}$$

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

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

C. 1

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

Answer: B

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133. Integration of some particular functions :

$$\int \frac{x + 2}{x^2 + 4x - 7} dx = ... + c$$

A. $\frac{1}{2}\left(x^2 + 4x - 7\right)^2$

B. $\frac{1}{2}\log\sqrt{|x^2 + 4x - 7|}$

C. $\log\sqrt{\left|x^2 + 4x - 7\right|}$

D. $\log\left|x^2 + 4x - 7\right|$

Answer: C

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134. Integration of some particular functions :

$\int \frac{2x + 3}{3x^2 + 4x + 5}dx = p\log\left|3x^2 + 4x + 5\right| + q\tan^{-1}\left(\frac{3x + 2}{\sqrt{11}}\right) + c$ then $p^2 + q^2 = ...$

A. $\frac{4}{11}$

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

C. $\frac{2}{11}$

D. $\frac{1}{11}$

Answer: A

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135. Integration by partial fraction :

$$\int \frac{x-1}{(x-3)(x-2)} dx = \ldots.$$

A. $\log(x-3) - \log(x-2) + c$

B. $\log(x-3)^2 - \log(x-2) + c$

C. $\log(x-3) + \log(x-2) + c$

D. $\log(x-3)^2 + \log(x-2) + c$

Answer: B

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136. Integration by partial fraction :

The value of $\int \frac{x}{(x-2)(x-1)} dx = \ldots.$

A. $\log_e \frac{(x-2)^2}{(x-1)} + p$

B. $\log_e \frac{(x-1)^2}{(x-2)} + p$

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

D. $2\log_e\left(\frac{x-2}{x-1}\right) + p$

Answer: A

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137. Integration by partial fraction :

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

A. $x + \log(x+3) + \log(x-2) + c$

B. $x - \log(x+3) + \log(x-2) + c$

C. $x - \log(x+3) - \log(x-2) + c$

D. None of these

Answer: B

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138. Integration by partial fraction :

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

A. $-\sqrt{2}\tan^{-1}x + \sqrt{3}\tan^{-1}x + c$

B. $-\sqrt{2}\frac{\tan^{-1}(x)}{\sqrt{2}} + \sqrt{3}\tan^{-1}x + c$

C. $\sqrt{2}\frac{\tan^{-1}(x)}{\sqrt{2}} + \sqrt{3}\tan^{-1}x + c$

D. None of these

Answer: B

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139. Integration by partial fraction :

If $\int \sin 5x \cos 3x dx = -\frac{\cos 8x}{16} + A$ then A=...

A. $\frac{\sin 2x}{16} + C$

B. $-\frac{\cos 2x}{4} + C$

C. C

D. None of these

Answer: B

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140. Integration by partial fraction :

$\int \frac{dx}{e^x + 1 - 2e^{-x}} = \dots.$

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

B. $\frac{1}{2}\log\left(e^x - 1\right) - \frac{1}{3}\log\left(e^x + 2\right) + c$

C. $\frac{1}{3}\log\left(e^x - 1\right) - \frac{1}{3}\log\left(e^x + 2\right) + c$

D. $\frac{1}{3}\log\left(e^x - 1\right) + \frac{1}{3}\log\left(e^x + 2\right) + c$

Answer: C

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141. Integration by partial fraction :

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

A. $\frac{1}{4}\log\left[\frac{x^2 - 1}{x^2 + 1}\right] + c$

B. $\frac{1}{4}\log\left[\frac{x^2 + 1}{x^2 - 1}\right] + c$

C. $\frac{1}{2}\log\left[\frac{x^2 - 1}{x^2 + 1}\right] + c$

D. $\frac{1}{2}\log\left[\frac{x^2 + 1}{x^2 - 1}\right] + c$

Answer: A

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142. Integration by partial fraction :

$\int \sin^5 x \cos^4 x dx = \ldots$

A. $-\frac{1}{5}\cos^5 x + \frac{2}{7}x - \frac{1}{9}\cos^9 x + c$

B. $\frac{1}{5}\cos^5 x + \frac{2}{7}x - \frac{1}{9}\cos^9 x + c$

C. $\frac{1}{5}\cos^5 x + \frac{2}{7}x + \frac{1}{9}\cos^9 x + c$

D. None of these

Answer: A

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143. $\int \frac{dx}{\sqrt{2x - x^2}} = \ldots.$

A. $\cos^{-1}(x-1)+c$

B. $\sin^{-1}(x-1)+c$

C. $\cos^{-1}(1+x)+c$

D. $\sin^{-1}(1-x)+c$

Answer: B

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144. $\int \frac{x^2}{\left(x^2+a^2\right)\left(x^2+b^2\right)}dx$

A. $\frac{1}{\left(a^2-b^2\right)}\left[\frac{1}{b}\tan^{-1}\left(\frac{x}{b}\right)-\frac{1}{a}\tan^{-1}\left(\frac{x}{a}\right)\right]+c$

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

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

D. $\frac{1}{a}\tan^{-1}\left(\frac{x}{b}\right)-\frac{1}{a}\tan^{-1}\left(\frac{x}{a}\right)+c$

Answer: A

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145. $\int \frac{1}{1+\cos^2 x} dx = \ldots.$.

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

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

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

D. None of these

Answer: C

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146. Integration by partial fraction :

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

A. $\frac{1}{\sqrt{7}}\tan^{-1}\left(\frac{4x+1}{\sqrt{7}}\right) + c$

B. $\frac{1}{2\sqrt{7}}\tan^{-1}\left(\frac{4x+1}{\sqrt{7}}\right) + c$

C. $\frac{1}{2}\tan^{-1}\left(\frac{4x+1}{\sqrt{7}}\right) + c$

D. None of these

Answer: D

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147. Integration by partial fraction :

$$\int \frac{dx}{x^2 + 4x + 13} = \ldots$$

A. $\log\left(x^2 + 4x + 13x\right) + c$

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

C. $\log(2x+4)+c$

D. $\frac{2x+4}{\left(x^2+4x+13\right)^2}+c$

Answer: B

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148. Integration by partial fraction :

$$\int \frac{3\sin x + 2\cos x}{3\cos x + 2\sin x}dx = \ldots$$

A. $\frac{12}{13}x - \frac{5}{13}\log(3\cos x + 2\sin x)$

B. $\frac{12}{13}x + \frac{5}{13}\log(3\cos x + 2\sin x)$

C. $\frac{13}{12}x + \frac{5}{13}\log(3\cos x + 2\sin x)$

D. None of these

Answer: A

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149. Integration by partial fraction :

$$\int \frac{dx}{x\left[(\log x)^2 + 4\log(x) - 1\right)}\Bigg) = ...$$

A. $\frac{1}{2\sqrt{5}}\log\left[\frac{\log x + 2 - \sqrt{5}}{\log x + 2 + \sqrt{5}}\right] + c$

B. $\frac{1}{\sqrt{5}}\log\left[\frac{\log x + 2 - \sqrt{5}}{\log x + 2 + \sqrt{5}}\right] + c$

C. $\frac{1}{2\sqrt{5}}\log\left[\frac{\log x + 2 + \sqrt{5}}{\log x + 2 - \sqrt{5}}\right] + c$

D. $\frac{1}{\sqrt{5}}\log\left[\frac{\log x + 2 + \sqrt{5}}{\log x + 2 - \sqrt{5}}\right] + c$

Answer: A

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150. Integration by partial fraction :

$$\int \frac{dx}{x\left(x^n+1\right)} = ...$$

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

B. $n\log\frac{x^n+1}{x^n}+c$

C. $\frac{1}{n}\log\frac{x^n}{x^n+1}+c$

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

Answer: C

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151. Integration by partial fraction :

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

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

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

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

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

Answer: D

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152. Integration by partial fraction :

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

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

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

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

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

Answer: D

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153. Integration by partial fraction :

If $\int \frac{2x^2 + 3 \cdot dx}{\left(x^2 - 1\right)\left(x^2 - 4\right)} = \log\left(\frac{x - 2}{x + 2}\right)^a \left(\frac{x + 1}{x - 1}\right)^b + c$ then the value of a and b are ...... Respectively.

A. $\frac{11}{12}, \frac{5}{6}$

B. $\frac{11}{12}, \frac{-5}{6}$

C. $-\frac{11}{12}, \frac{5}{6}$

D. None of these

Answer: D

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154. Integration by partial fraction :

$$\int \frac{xdx}{x^4+x^2+1} = \ldots\ldots$$

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

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

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

D. None of these

Answer: B

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155. Integration by partial fraction :

$$\int \frac{4e^x+6e^{-x}}{9e^x-4e^{-x}}dx = Ax + B\log\left(9e^x-4e^{-x}\right) + c$$ then A+B=.

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

B. $\frac{4}{36}$

C. $\frac{35}{36}$

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

Answer: A

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156. Integration by partial fraction :

$$\int \frac{x^2}{(x\sin x + \cos x)^2}dx = \ldots. + c$$

A. $\frac{\sin x + \cos x}{x\sin x + \cos x}$

B. $\frac{x\sin x - \cos x}{x\sin x + \cos x}$

C. $\frac{\sin x - x\cos x}{x\sin x + \cos x}$

D. None of these

Answer: C

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157. Integration by partial fraction :

$$\int \frac{dx}{\sin x - \cos x + \sqrt{2}} = \dots. + c$$

A. $-\frac{1}{\sqrt{2}}\tan\left(\frac{x}{2} + \frac{\pi}{8}\right)$

B. $\frac{1}{\sqrt{2}}\tan\left(\frac{x}{2} + \frac{\pi}{8}\right)$

C. $\frac{1}{\sqrt{2}}co\left(\frac{x}{2} + \frac{\pi}{8}\right)$

D. $-\frac{1}{\sqrt{2}}co\left(\frac{x}{2} + \frac{\pi}{8}\right)$

Answer: D

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158. Integration by partial fraction :

$$\int \frac{dx}{4\sin^2 x + 5\cos^2 x} dx = \ldots + c$$

A. $\frac{1}{\sqrt{5}} \tan^{-1}\left(\frac{2\tan x}{\sqrt{5}}\right)$

B. $\frac{1}{\sqrt{5}} \tan^{-1}\left(\frac{\tan x}{\sqrt{5}}\right)$

C. $\frac{1}{2\sqrt{5}} \tan^{-1}\left(\frac{2\tan x}{\sqrt{5}}\right)$

D. None of these

Answer: C

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159. Integration by partial fraction :

$$\int \frac{adx}{b + ce^x} = \ldots. + c$$

A. $\frac{a}{b} \log\left(\frac{e^x}{b + ce^x}\right)$

B. $\frac{a}{b}\log\left(\frac{b+ce^{x}}{b+ce^{x}}\right)$

C. $\frac{b}{a}\log\left(\frac{b+ce^{x}}{b+ce^{x}}\right)$

D. $\frac{b}{a}\log\left(\frac{b+ce^{x}}{e^{x}}\right)$

Answer: A

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160. Integration by partial fraction :

$\int\frac{5x^{4}+4x^{5}}{\left(x^{5}+x+1\right)^{2}}dx=f(x)+c$ then f(x)=.....

A. $\frac{1}{x^{5}+x+1}$

B. $\frac{x^{5}}{x^{5}+x+1}$

C. $\frac{x^{4}}{x^{5}+x+1}$

D. $\dfrac{1}{\left(x^5+x+1\right)^3}$

Answer: B

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161. Integration by partial fraction :

$$\int \frac{dx}{x^4-1} = \dots\ + c$$

A. $\frac{1}{4}\log\left|\frac{x+1}{x-1}\right|$

B. $\frac{1}{4}\log\left|\frac{x+1}{x-1}\right| - \frac{1}{2}\tan^{-1}x$

C. $\frac{1}{2}\log\left|\frac{x^2-1}{x+1}\right|$

D. $\frac{1}{4}\log\left|\frac{x+1}{x-1}\right| - \frac{1}{2}\tan^{-1}\frac{x}{2}$

Answer: B

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162. Integration by partial fraction :

$$\int \frac{x^3 dx}{x^2 + a^2} = ... + c$$

A. $\frac{x^2}{2} + \frac{a^2}{2}\log\left|x^2 + a^2\right|$

B. $\frac{x^2}{2} + a^2\log\left|x^2 + a^2\right|$

C. $x^2 + \frac{a^2}{2}\log\left|x^2 + a^2\right|$

D. $\frac{x^2}{2} - \frac{a^2}{2}\log\left|x^2 + a^2\right|$

Answer: D

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163. Integration by partial fraction :

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

A. $\log\left|\frac{x}{x+1}\right| - \frac{1}{x}$

B. $\log|x(x+1)| - \frac{1}{x}$

C. $\log\left|\frac{x+1}{x}\right| - \frac{1}{x}$

D. $\log\left|\frac{x+1}{x^2}\right| + \frac{1}{x^2}$

Answer: C

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164. Method of integration by parts :

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

A. $\frac{x^4}{4} - \frac{1}{4}x\sin 2x - \frac{1}{8}\cos 2x + c$

B. $\frac{x^4}{4} + \frac{1}{4}x\sin 2x + \frac{1}{8}\cos 2x + c$

C. $\frac{x^4}{4} - \frac{1}{4}x\sin 2x + \frac{1}{8}\cos 2x + c$

D. $\frac{x^4}{4} + \frac{1}{4}x\sin 2x + \frac{1}{8}\cos 2x + c$

Answer: B

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165. Method of integration by parts :

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

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

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

C. $(x - 1)\tan^{-1}x$

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

Answer: B

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166. Method of integration by parts :

$\int[\sin(\log x) + \cos(\log x)]dx = ...$

A. $x\cos(\log x) + c$

B. $\sin(\log x) + c$

C. $\cos(\log x) + c$

D. $x\sin(\log x) + c$

Answer: D

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167. Method of integration by parts :

$\int x\sin x\sec^3 x dx = ...$

A. $\frac{1}{2}\left[\sec^2 x - \tan x\right] + c$

B. $\frac{1}{2}\left[x\sec^2 x - \tan x\right] + c$

C. $\frac{1}{2}\left[x\sec^2 x + \tan x\right] + c$

D. $\frac{1}{2}\left[x\sec^2 x - \tan x\right] + c$

Answer: B

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168. Method of integration by parts :

$\int \log(x + 1)dx = ...$

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

B. $(x + 1)\log(x + 1) + x + c$

C. $(x - 1)\log(x + 1) - x + c$

D. $(x - 1)\log(x + 1) + x + c$

Answer: A

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169. Method of integration by parts :

If $\int \log\left(x^2 + x\right)dx = x\log\left(x^2 + x\right) + A$ then A=.....

A. $2x + \ln(x + 1) +$ constant

B. $2x - \ln(x + 1) +$ constant

C. constant

D. None of these

Answer: D

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170. Method of integration by parts :

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

A. $\frac{1}{2}x^2 \cos 2x + \frac{1}{2}x\sin 2x + \frac{1}{4}\cos 2x + c$

B. $-\frac{1}{2}x^2 \cos 2x + \frac{1}{2}x\sin 2x + \frac{1}{4}\cos 2x + c$

C. $\frac{1}{2}x^2\cos 2x - \frac{1}{2}x\sin 2x + \frac{1}{4}\cos 2x + c$

D. None of these

Answer: B

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171. Method of integration by parts :

$\int x^n \log x dx = ...$

A. $\frac{x^{n+1}}{n+1}\left\{\log x + \frac{1}{n+1}\right\} + c$

B. $\frac{x^{n+1}}{n+1}\left\{\log x + \frac{2}{n+1}\right\} + c$

C. $\frac{x^{n+1}}{n+1}\left\{2\log x - \frac{1}{n+1}\right\} + c$

D. $\frac{x^{n+1}}{n+1}\left\{\log x - \frac{1}{n+1}\right\} + c$

Answer: D

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172. Method of integration by parts :

$$\int\left[\frac{1}{\log x} - \frac{1}{(\log x)^2}\right]dx = ...$$

A. $\frac{1}{\log x} + c$

B. $\frac{x}{\log x} + c$

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

D. None of these

Answer: B

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173. $\int \frac{\log x}{(1 + \log x)^2} dx = ...$

A. $\frac{1}{1 + \log x} + c$

B. $\dfrac{1}{(1+\log x)^2}+c$

C. $\dfrac{x}{1+\log x}+c$

D. $\dfrac{1}{(1+\log x)^2}+c$

Answer: C

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174. Method of integration by parts :

$$\int e^{2x}\frac{1+\sin 2x}{1+\cos 2x}dx = \ldots .$$

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

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

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

D. $e^x \tan x + c$

Answer: D

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175. Method of integration by parts :

$\int[f(x)g''(x) - f''(x)g(x)]dx = ...$

A. $\dfrac{f(x)}{g'(x)}$

B. $f'(x)g(x) - f(x)g'(x)$

C. $f(x)g'(x) - f'(x)g(x)$

D. $f(x)g'(x) + f'(x)g(x)$

Answer: C

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176. Method of integration by parts :

$\int\dfrac{\log x}{(x+1)^2}dx = ...$

A. $\dfrac{-\log x}{x+1} + \log x - \log(x+1)$

B. $\dfrac{\log x}{(x+1)} + \log x - \log(x+1)$

C. $\dfrac{\log x}{x+1} - \log x - \log(x+1)$

D. $\dfrac{-\log x}{x+1} - \log x - \log(x+1)$

Answer: A

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177. If $\dfrac{d}{dx}f(x) = \cos x + \sin x$ and $f(0) = 2$, then `f(x)=.....

A. $x\sin x$

B. $-\cos x + \sin x + 3$

C. $x\sin x + 2$

D. $x\cos x + 2$

Answer: C

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178. Method of integration by parts :

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

A. $x\sec^{-1}x + \cos^{-1}x + c$

B. $x\sec^{-1}x - \cos^{-1}x + c$

C. $x\sec^{-1}x - \sin^{-1}x + c$

D. None of these

Answer: B

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179. Method of integration by parts :

$\int e^{x}[\tan x - \log(\cos x)]dx = ...$.

A. $e^{x}\log(\sec x) + c$

B. $e^x\log(\operatorname{cosec}x) + c$

C. $e^x\log(\sec x) + c$

D. $e^x\log(\sin x) + c$

Answer: A

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180. Method of integration by parts :

$$\int e^{2x}\frac{1 + \sin 2x}{1 + \cos 2x}dx = \text{....} .$$

A. $e^{2x}\tan x + c$

B. $e^{2x}\cot x + c$

C. $\dfrac{e^{2x}\tan x}{2} + c$

D. $\dfrac{e^{2x}\cot x}{2} + c$

Answer: C

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181. Method of integration by parts :

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

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

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

C. $e^x(x+1)(x-1) + c$

D. None of these

Answer: A

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182. Method of integration by parts :

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

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

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

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

D. None of these

Answer: B

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183. Method of integration by parts :

If $\int \frac{e^x(1 + \sin x)dx}{1 + \cos x} = e^x f(x) + c,$ then f(x)=

A. $\sin\frac{x}{2}$

B. $\cos\frac{x}{2}$

C. $\tan\frac{x}{2}$

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

Answer: C

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184. Method of integration by parts :

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

A. $2\sqrt{x} - e^{\sqrt{x}} - 4\sqrt{x}e^{\sqrt{x}+c}$

B. $\left(2x - 4\sqrt{x} + 4\right)e^{\sqrt{x}+c}$

C. $\left(2x + 4\sqrt{x} + 4\right)e^{\sqrt{x}} + c$

D. $\left(1 - 4\sqrt{x}\right)e^{\sqrt{x}} + c$

Answer: B

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185. Method of integration by parts :

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

A. $\dfrac{x+\tan^{-1}x}{\sqrt{1+x^2}}+c$

B. $\dfrac{x-\tan^{-1}x}{\sqrt{1+x^2}}+c$

C. $\dfrac{\tan^{-1}x-x}{\sqrt{1+x^2}}+c$

D. None of these

Answer: B

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186. Method of integration by parts :

$I_1 = \int \sin^{-1}x\,dx$ and $I_2 = \int \sin^{-1}\sqrt{1-x^2}\,dx$ then.....

A. $I_1 = I_2$

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

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

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

Answer: C

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187. Method of integration by parts :

The anti derivative of f(x) and e^x and the anti derivative of g(x) is $\cos x$,

then, $\int f(x)\cos x dx + \int g(x)e^x dx =$ ....

A. $f(x)g(x) + c$

B. $f(x) + g(x) + c$

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

D. $f(x) - g(x) + c$

Answer: C

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188. Method of integration by parts :

$$\int\left(\cos^{-1}x+\cos^{-1}\sqrt{1-x^2}\right)dx=Ax+f(x)\sin^{-1}x-2\sqrt{1+x^2}+c,\ \forall x\in[-1,0)$$

then ....

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189. Method of integration by parts :

If $\int\frac{xe^x}{\sqrt{1+e^x}}dx=f(x)\sqrt{1+e^x}-2\log g(x)+c$ then ....

A. $f(x)=x-1,\ g(x)=\frac{\sqrt{1+e^x}+1}{\sqrt{1+e^x}-1}$

B. $f(x)=2x-4,\ g(x)=\frac{\sqrt{1+e^x}-1}{\sqrt{1+e^x}+1}$

C. $f(x) = x - 1, g(x) = \dfrac{\sqrt{1 + e^x} - 1}{\sqrt{1 + e^x} + 1}$

D. None of these

Answer: B

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190. Method of integration by parts :

$\int \sin^5 x dx = -\dfrac{\sin^4 x \cos x}{5} + A\sin^2 x \cos x + B\cos x + c$ then the value of A+B is ....

A. $-\dfrac{2}{3}$

B. $-\dfrac{3}{4}$

C. $-\dfrac{4}{5}$

D. $-\dfrac{5}{6}$

Answer: C

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191. Method of integration by parts :

If $\int f(x)dx = \phi(x)$ then $\int x^5 f\left(x^3\right)dx = \ldots\ldots\ldots$

A. $\frac{1}{3}\left[x^3\phi\left(x^3\right) - \int x^2\phi\left(x^3\right)dx\right] + c$

B. $\frac{1}{3}\left[x^3\phi\left(x^3\right) - 3\int x^3\phi\left(x^2\right)dx\right] + c$

C. $\frac{1}{3}\left[x^2\phi\left(x^3\right) - 3\int x^2\phi\left(x^3\right)dx\right] + c$

D. $\frac{1}{3}\left[x^3\phi\left(x^3\right) - 3\int x^3\phi\left(x^3\right)dx\right] + c$

Answer: C

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192. Method of integration by parts :

$\int e^{3x}\cos 4x dx = e^{3x}(A\sin 4x + B\cos 4x) + c$ then.....

A. $4A = 3B$

B. $2A = 3B$

C. $3A = 4B$

D. $4A + 3B = 1$

Answer: D

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193. Method of integration by parts :

$\int e^{2x} \cdot x^4 dx = \frac{e^{2x}}{2} f(x) + c$ then f(x)=.....

A. $\frac{1}{2}x^4 - 2x^3 + 3x^2 - 3x + \frac{3}{2})$

B. $\left(x^4 - x^3 + 2x^2 - 3x + 2\right)$

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

D. $\left(x^4 - 2x^3 + 2x^2 - 3x + \frac{3}{2}\right)$

Answer: C

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194. Method of integration by parts :

If $\int_n = \int (\sin x)^n dx, x \in N$ then the value $\left(5I_4 - 6I_6\right)$ is .....

A. $\sin x \left(\cos x^5 + c\right.$

B. $\sin 2x - \cos 2x + c$

C. $\frac{\sin 2x}{8}\left(\cos^2 2x + 1 - \cos 2x\right) + c$

D. None of these

Answer: C

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195. Method of integration by parts :

If $I_n = \int \cot^n x dx$ then $I_0 + I_1 + 2\left(I_2 + I_3 + , ... + I_8\right) + I_9\left(+ I_{10} = ...\right.$

A. $u + \frac{u^2}{2} + ... + \frac{u^9}{9}$

B. $-\left(u + \frac{u^2}{2} + ... + \frac{u^2}{9}\right)$

C. $-\left(u + \frac{u^2}{2!} + ... + \frac{u^2}{9!}\right)$

D. $\frac{u}{2} + \frac{2u^2}{3} + ... + \frac{9u^9}{10}$

Answer: B

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196. Method of integration by parts :

If $u = \int e^{ax}\cos bx dx$ and $v = \int e^{ax}\sin bx dx$ then $\left(a^2 + b^2\right)\left(u^2 + v^2\right) = ...$

A. e^{2ax}

B. $\left(a^2 + b^2\right)e^{2ax}$

C. e^{ax}

D. $\left(a^2 - b^2\right)e^{2ax}$

Answer: A

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197. Integration by partial fraction :

$$\int \frac{x^2}{(x\sin x + \cos x)^2} dx = \ldots. + c$$

A. $\dfrac{\sin x + x\cos x}{x\sin x + \cos x}$

B. $\dfrac{six - x\cos x}{x\sin x + \cos x}$

C. $\dfrac{\sin x - x\cos x}{x\sin x - \cos x}$

D. None of these

Answer: D

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198. Method of integration by parts :

$\int \cos(\log x)dx = ... + c$

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

B. $\frac{x}{4}[\cos(\log x) + \sin(\log x)]$

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

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

Answer: A

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199. Method of integration by parts :

$\int e^x \sin x \cos x dx = ... + c$

A. $\frac{e^x}{2\sqrt{5}}\cos\left(2x - \tan^{-1}2\right)$

B. $\frac{e^x}{2\sqrt{5}}\sin\left(2x - \tan^{-1}2\right)$

C. $\frac{e^x}{2\sqrt{5}}\sin\left(2x + \tan^{-1}2\right)$

D. $\frac{e^x}{2\sqrt{5}}\sin\left(2x + \pi - \tan^{-1}2\right)$

Answer: B

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200. Integrate the following functions :

$$\frac{5 + \log x}{(6 + \log x)^2}$$

A. $\frac{x}{\log_e x + 6}$

B. $\frac{1}{5 + \log_e x}$

C. $\frac{x}{\log_e x + 5}$

D. $\frac{e^x}{\log_e x + 6}$

Answer: A

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201. $\int \frac{e^{\tan^{-1}(x)}}{1+x^2}\left(1+x+x^2\right)dx = \dots + c$

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

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

C. $x.\left(e^{\tan^{-1}x}\right)$

D. $\frac{x}{1+x}\left(e^{\tan^{-1}x}\right)$

Answer: C

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202. Integrate the functions

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

A. $e^x \cot x$

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

C. $e^x \tan\frac{x}{2}$

D. $e^{\frac{x}{2}}. \tan\frac{x}{2}$

Answer: C

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203. Integrate the following functions :

$$e^x\left(\frac{1 + x\log x}{x}\right)$$

A. $e^x \log x$

B. $x. e^x$

C. $\frac{1}{x}\log x$

D. $e^{-x}\log x$

Answer: A

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204. $\int\left(\log x+\frac{1}{x^2}\right)e^x dx = \dots\dots\dots\dots + c$

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

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

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

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

Answer: D

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205. $\int \left(x^6 + 7x^5 + 6x^4 + 5x^3 + 4x^2 + 3x + 1\right)e^x dx = \ldots\ldots. + c$

A. $\sum_{i=0}^{7} x^i e^x$

B. $\sum_{i=1}^{6} x^i e^x$

C. $\sum_{i=0}^{6} i e^x$

D. $\sum_{i=0}^{6} (xe)^i$

Answer: B

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206. $\int x\cos 2x dx = \ldots\ldots. + c$

A. $\frac{x\sin 2x}{2} + \frac{\cos 2x}{4}$

B. $x\cos 2x - \frac{1}{2}\cos 2x$

C. $\frac{x\sin 2x}{2} + \frac{\cos 2x}{2}$

D. $\frac{x^2\cos 2x}{2}+\frac{\sin 2x}{2}$

Answer: A

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207. $\int \sin^{-1}x dx = ... + c$

A. $\cos^{-1}x$

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

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

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

Answer: C

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208. $\int e^x\left(\cot x - \cot^2 x\right)dx = \ldots\ldots\ + c$

A. $e^x \mathrm{cosec}^2 x$

B. $e^x \cot x$

C. $e^x(\cot x + 1)$

D. $e^x(\cot x - 1)$

Answer: C

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209. $\int \frac{e^x}{x+1}[1 + (x+1)\log(x+1)]dx = \ldots\ldots + c$

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

B. $e^x(x+1)$

C. $e^x \log(x+1)$

D. $e^x[\log(x+1)+1]$

Answer: C

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210. $\int \frac{x-1}{(x+1)^3}e^x dx = \ldots\ldots\ + c$

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

B. $\frac{-e^x}{(x+1)^2}$

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

D. $\frac{-e^x}{(x+1)^3}$

Answer: A

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211. If $\int x.\, e^{2x}dx = e^{2x}f(x) + c$ where c is arbitary constant then f(x)=.......

A. $\frac{x - 4}{6}$

B. $\frac{2x - 1}{4}$

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

D. $\frac{3x - 1}{4}$

Answer: B

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212. $\int e^{3x}\cos 4x dx = \dots\dots\dots + c$

A. $\frac{e^{3x}}{25}(3\cos 4x - 4\sin 4x)$

B. $\frac{e^{3x}}{5}(3\cos 4x - 4\sin 4x)$

C. $\frac{e^{3x}}{5}(3\cos 4x + 4\sin 4x)$

D. $\frac{e^{3x}}{5}\cos\left(4x - \tan^{-1}\frac{4}{3}\right)$

Answer: D

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213. $\int e^{4x}\sin 3x dx = \ldots\ldots + c$

A. $\frac{e^{4x}}{25}(\sin x + \cos x)$

B. $\frac{e^{4x}}{25}(4\sin 3x - 3\cos 3x)$

C. $\frac{e^{4x}}{5}(4\sin 3x - 3\cos 3x)$

D. $\frac{e^{4x}}{25}(4\sin 3x - 3\cos 3x)$

Answer: B

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214. $\int e^{\frac{x}{\sqrt{2}}}\cos\left(\frac{x}{\sqrt{2}}\right)dx = \ldots\ldots + c$

A. $e^{\frac{x}{\sqrt{2}}}\sin\left(\frac{x}{\sqrt{2}} - \frac{\pi}{4}\right)$

B. $e^{\frac{x}{\sqrt{2}}}\sin\left(\frac{x}{\sqrt{2}} + \frac{\pi}{4}\right)$

C. $e^{\frac{x}{\sqrt{2}}}\cos\left(\frac{x}{\sqrt{2}} + \frac{\pi}{4}\right)$

D. $\frac{e^{\frac{x}{\sqrt{2}}}}{\sqrt{2}}\cos\left(\frac{x}{\sqrt{2}} + \frac{\pi}{4}\right)$

Answer: B

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215. $\int x.\tan^{-1}x dx = \ldots\ldots + c$

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

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

C. $(x+1)\tan^{-1}x+x$

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

Answer: B

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216. $\int e^{2x}\left(\log 2x+\frac{1}{2x}\right)dx = \text{.........} + c$

A. $\frac{e^{2x}}{2}\log 2x$

B. $e^{2x}\log 2x$

C. $\frac{e^{x}}{2}\log x$

D. $\frac{e^{2x}}{2}\log x$

Answer: A

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217. $\int x^3 . e^{x^2} dx = ... + c$

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

B. $\left(\dfrac{x^2-1}{2}\right)e^{x^2}$

C. $x^2 e^x$

D. $\dfrac{x^3}{3} e^{x^2}$

Answer: B

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218. Some standard forms of integration :

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

A. $\dfrac{1}{6}\left(x^3\sqrt{x^6-1} + \cos^{-1}x^3\right)$

B. $\dfrac{1}{6}\left(x^3\sqrt{x^6-1} + \sin^{-1}x^3\right)$

C. $\frac{1}{6}\left(x^3\sqrt{x^6-1}+\log\left|x^3+\sqrt{x^6-1}\right|\right)$

D. $\frac{1}{6}\left(x^3\sqrt{x^6-1}-\log\left|x^3+\sqrt{x^6-1}\right|\right)$

Answer: D

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219. Some standard forms of integration :

$\int\sqrt{x^2-4x+2dx}=\ldots\ldots\ldots\ +c$

A. $\frac{x-2}{2}\sqrt{x^2-4x+2}+\log\left|x-2+\sqrt{x^2-4x+2}\right|$

B. $\frac{x-2}{2}\sqrt{x^2-4x+2}-\log\left|x-2+\sqrt{x^2-4x+2}\right|$

C. $\frac{x-2}{2}\sqrt{x^2-4x+2}+\sin^{-1}\left(\frac{x-2}{2}\right)$

D. $\frac{x-2}{2}\sqrt{x^2-4x+2}+\frac{1}{2}\sin^{-1}\left(\frac{x-2}{2}\right)$

Answer: B

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220. Some standard forms of integration :

$\int \sqrt{1 - 4x - x^2} dx = \ldots\ldots\ldots + c$

A. $\frac{x+2}{2}\sqrt{1 - 4x - x^2} + \frac{\sqrt{5}}{2}\sin^{-1}\left(\frac{x+2}{5}\right)$

B. $\frac{x+2}{2}\sqrt{1 - 4x - x^2} + \frac{5}{2}\sin^{-1}\left(\frac{x+2}{5}\right)$

C. $\frac{x+2}{2}\sqrt{1 - 4x - x^2} - \frac{5}{2}\sin^{-1}\left(\frac{x+2}{\sqrt{5}}\right)$

D. $\frac{x+2}{2}\sqrt{1 - 4x - x^2} + \frac{5}{2}\sin^{-1}\left(\frac{x+2}{\sqrt{5}}\right)$

Answer: D

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221. Some standard forms of integration :

$\int \sqrt{3 - x^2} dx = \ldots\ldots\ldots\ldots\ldots + c$ (where $|x| < \sqrt{3}$)

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

B. $\frac{x}{2}\sqrt{3-x^2}+\frac{3}{2}\log\left(x+\sqrt{3-x^2}\right)$

C. $\frac{x}{2}\sqrt{3-x^2}-\frac{3}{2}\log\left(\sqrt{\frac{3}{x}}\right)$

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

Answer: A

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222. Some standard forms of integration :

$\int \sin x\sqrt{4-\cos^2 x}dx = ...+c$

A. $-\frac{\cos x}{2}\sqrt{4-\cos^2 x}+2\log\left|x+\sqrt{4-\cos^2 x}\right|$

B. $-\frac{\cos x}{2}\sqrt{4-\cos^2 x}+2\sin^{-1}\left(\frac{\cos x}{2}\right)$

C. $-\frac{\cos x}{2}\sqrt{4-\cos^2 x}-2\sin^{-1}\left(\frac{\cos x}{2}\right)$

D. $\frac{\cos x}{2}\sqrt{4-\cos^2 x}+2\sin^{-1}\left(\frac{\cos x}{2}\right)$

Answer: C

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223. Some standard forms of integration :

$\int\sqrt{x^2+7}dx = \text{.........} \ + C$

A. $\frac{x}{2}\sqrt{x^2+7}+\frac{7}{2}\log\left|x+\sqrt{x^2+7}\right|$

B. $\frac{x}{2}\sqrt{x^2+7}+\frac{\sqrt{7}}{2}\log\left|x-\sqrt{x^2+7}\right|$

C. $\frac{x}{2}\sqrt{x^2+7}+\frac{7}{2}\sin^{-1}\frac{x}{\sqrt{7}}$

D. $\log\left|x+\sqrt{x^2+7}\right|$

Answer: A

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224. Definite integration as the limit of a sum :

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

A. e

B. e-1

C. 1-e

D. e+1

Answer: B

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225. Definite integration as the limit of a sum :

$$\lim_{n \to \infty} \frac{1^p + 2^p + 3^p + \text{.......} + n^p}{n^{p+1}} = \text{..........} .$$

A. 1

B. $\frac{1}{p+1}$

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

D. p^2

Answer: B

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226. Definite integration as the limit of a sum :

$$\lim_{n \to \infty} \sum_{r=1}^{4n} \frac{\sqrt{n}}{\sqrt{r}\left(3\sqrt{r}+4\sqrt{n}\right)^2} = \text{..........}.$$

A. $\frac{1}{35}$

B. $\frac{1}{14}$

C. $\frac{1}{10}$

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

Answer: C

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227. Definite integration as the limit of a sum :

$$\lim_{n \to \infty} \sum_{k=0}^{n} \frac{n}{n^2 + k^2} = \ldots\ldots\ldots$$

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

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

C. π

D. 0

Answer: C

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228. Definite integration as the limit of a sum :

$$\lim_{n \to \infty} \left[\frac{1}{n^2} \sec^2 \frac{1}{n^2} + \frac{2}{n^2} \sec^2 \frac{4}{n^2} + \ldots\ldots. + \frac{1}{n} \sec^2 1 \right]$$

a. 'tan1 b. 1/2tan1 c. 1/2sec1 d. 1/2cosec 1`

A. $\tan 1$

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

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

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

Answer: B

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229. Definite integration as the limit of a sum :

$$\lim_{n \to \infty} \sum_{K=1}^{n} \frac{K}{n^2 + K^2} = \ldots\ldots$$

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

B. $\log 2$

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

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

Answer: A

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230. Definite integration as the limit of a sum :

$$\lim_{n \to \infty}\left[\frac{n}{1+n^2}+\frac{n}{4+n^2}+\frac{n}{9+n^2}+\ldots\ldots\ldots+\frac{n}{2n^2}\right]=\ldots\ldots$$

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

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

C. 1

D. None of these

Answer: B

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231. Definite integration as the limit of a sum :

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

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

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

C. $2\sqrt{2}$

D. 2

Answer: B

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232. Definite integration as the limit of a sum :

$$\lim_{n \to \infty}\frac{1}{n}+\frac{1}{n+1}+\frac{1}{n+2}+\ldots\ldots+\frac{1}{2n}$$

A. 0

B. $\log_e 4$

C. $\log_e 3$

D. $\log_e 2$

Answer: D

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233. Definite integration as the limit of a sum :

$$\lim n \to \infty \left[\frac{n!}{n^n}\right]^{\frac{1}{n}} = \ldots\ldots\ldots$$

A. e

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

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

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

Answer: B

234. Definite integration as the limit of a sum :

$$\lim_{n \to \infty} \frac{1}{n} \sum_{r=n+1}^{2n} \log\left(1 + \frac{r}{n}\right) = \ldots\ldots\ldots\ldots$$

A. $\log\left(\frac{27}{4e}\right)$

B. $\log\left(\frac{27}{e^2}\right)$

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

D. None of these

Answer: A

235. Definite integration as the limit of a sum :

$$\lim_{n \to \infty} \left[\frac{1}{n} + \frac{n^2}{(n+1)^3} + \frac{n^2}{(n+2)^3} + \dots\dots\dots + \frac{1}{8n}\right] = \dots\dots\dots .$$

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

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

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

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

Answer: A

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236. Definite integration as the limit of a sum :

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

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

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

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

D. $\frac{1}{2}e^{\frac{\pi - 4}{2}}$

Answer: A

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237. Fundamental theorem of definite integral :

If $I_n = \int_0^{\frac{\pi}{4}} \tan^n dx$ then $\lim_{n \to \infty} n\left(I_n + I_{n+2}\right) = ...$

A. 1

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

C. ∞

D. 0

Answer: A

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238. Fundamental theorem of definite integral :

$f(x) = \int_2^x \frac{dt}{\sqrt{1+t^4}}$ and g is a inverse function of f then g'(0) =............

A. 1

B. 17

C. $\sqrt{17}$

D. None of these

Answer: C

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239. Fundamental theorem of definite integral :

$f(x) = \int_1^x \sqrt{2-t^2}dt$ then real roots of the equation $x^2 - f'(x) = 0$ are ....

A. ± 1

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

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

D. 0 and 1

Answer: A

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240. Fundamental theorem of definite integral :

If $\int_{\sin x}^{1} t^2 f(t) dt = (1 - \sin x)$ then $f\left(\frac{1}{\sqrt{3}}\right) = \ldots\ldots.$.

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

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

C. 3

D. $\sqrt{3}$

Answer: C

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241. Fundamental theorem of definite integral :

$I = \int_0^1 \frac{\sin x}{\sqrt{x}} dx$ and $J = \int_0^1 \frac{\cos x}{\sqrt{x}} dx$ then which of the following statement is true ?

A. $I > \frac{2}{3}$ and $J > 2$

B. $I < \frac{2}{3}$ and $J < 2$

C. $I < \frac{2}{3}$ and $J > 2$

D. $I > \frac{2}{3}$ and $J < 2$

Answer: B

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242. Fundamental theorem of definite integral :

$\frac{d}{dx}(F(x)) = \frac{e^{\sin x}}{x}, n > 0$. If $\int_1^4 \frac{2e^{\sin x^2}}{x} dx = F(k) - F(1)$ then the possible value of k is........

A. 4

B. 8

C. 16

D. 32

Answer: C

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243. $\int_1^2 \log x dx = \ldots\ldots\ldots$

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

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

C. $\log\left(\frac{e^2}{4}\right)$

D. $\log_e\left(\frac{4}{e}\right)$

Answer: D

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244. Fundamental theorem of definite integral :

If $\int_0^k \frac{dx}{1+4x^2} = \frac{\pi}{8}$ then k =........

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

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

C. 1

D. π

Answer: A

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245. $\int_3^5 \frac{t^2}{t^2 - 4} dx =$ ....

A. $2 - \log\left(\frac{14}{15}\right)$

B. $2 + \log\left(\frac{15}{7}\right)$

C. $2 + \log\left(\frac{14}{15}\right)$

D. 0

Answer: B

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246. $\int_0^{\pi} e^x \cos 2x dx =$ ....

A. $\frac{1}{5}\left(e^{\frac{\pi}{2}} - 1\right)$

B. $\frac{1}{5}(e - 1)$

C. $\frac{1}{5}\left(e^{\pi} - 1\right)$

D. $\frac{1}{5}\left(e^{\pi} - e\right)$

Answer: C

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247. Fundamental theorem of definite integral :

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

A. 0

B. $\frac{42}{5}$

C. $\frac{63}{5}$

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

Answer: B

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248. Fundamental theorem of definite integral :

$$\int_0^{\frac{\pi}{4}} \frac{\sin^9 x}{\cos^{11} x} dx = \text{.......} .$$

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

B. $\frac{1}{10}$

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

D. $\frac{1}{15}$

Answer: B

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249. Fundamental theorem of definite integral :

$$\int_0^{\pi} \sqrt{1 + 4\sin^2\frac{x}{2} - 4\sin\frac{x}{2}}dx = \text{......}$$

A. $4\sqrt{3} - 4$

B. $4\sqrt{3} - 4 - \frac{\pi}{3}$

C. π - 4

D. $\frac{2\pi}{3}$ - 4 - $4\sqrt{3}$

Answer: B

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250. Fundamental theorem of definite integral :

$$\int_0^{\frac{\pi}{4}} \tan^{100} x dx + \int_0^{\frac{\pi}{4}} \tan^{102} x dx = \text{.......} .$$

A. $\frac{1}{102}$

B. $\frac{1}{100}$

C. 101

D. $\frac{1}{101}$

Answer: D

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251. Fundamental theorem of definite integral :

$\int_a^b \frac{\log x}{x} dx =$ ...... (where a $b \in R^+$)

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

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

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

D. $\frac{1}{2}\log(ab)\log\left(\frac{b}{a}\right)$

Answer: D

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252. Fundamental theorem of definite integral :

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

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

B. 0

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

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

Answer: B

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253. $\int_0^5 \sqrt{25 - x^2}dx = $ ....

A. $\frac{25\pi}{4}$

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

C. $\frac{25}{4}$

D. 25π

Answer: A

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254. Evaluation of definite integrals by subsitiution and properties of its :

$$\int_1^{\infty}\left(e^{x+1}+e^{3-x}\right)^{-1}dx = \text{............} .$$

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

B. $\dfrac{\pi}{4e}$

C. $\dfrac{1}{e^2}\left[\dfrac{\pi}{2}-\tan^{-1}\left(\dfrac{1}{c}\right)\right]$

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

Answer: A

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255. Evaluation of definite integrals by subsitiution and properties of its :

$$\int_0^{\infty} f\left(x+\frac{1}{x}\right)\frac{\log x}{x}dx = \text{..........} .$$

A. 0

B. 1

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

D. can not decide

Answer: A

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256. Evaluation of definite integrals by subsitiution and properties of its :

If anti derivative of $f(x) = \frac{\sin x}{x}$ is F(x) then $\int_1^3 \frac{\sin 2x}{x} dx = ...(x > 0)$

A. $F(6) - F(2)$

B. $\frac{1}{2}(F(6) - F(2)]$

C. $\frac{1}{2}(F(3) - F(1)]$

D. $2(F(6) - F(2)]$

Answer: A

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257. Evaluation of definite integrals by subsitiution and properties of its :

$\int_0^2 \left[x^2\right]dx = ...$ where [.] denotes maximum integer function.

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

B. $5 - \sqrt{3} - \sqrt{2}$

C. $\sqrt{5} - \sqrt{3}$

D. None of these

Answer: B

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258. Evaluation of definite integrals by subsitiution and properties of its :

$\int_{-1}^{1}(x - [x])dx = ...$. where [.] denotes maximum integer function.

A. 0

B. 1

C. 2

D. 3

Answer: B

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259. Evaluation of definite integrals by subsitiution and properties of its :

$\int_{0}^{2}\{x\}dx = ...$ where $\{x\}$ denotes fractional part of x.

A. 0

B. 1

C. 2

D. 3

Answer: B

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260. $\int_0^{\pi}|\cos x|dx = ...$

A. 2

B. 1

C. 0

D. -1

Answer: A

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261. Evaluate the following integrals.

$\int_0^2 \left|x^2 + 2x - 3\right| dx$

A. 1

B. 2

C. 3

D. 4

Answer: D

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262. Evaluation of definite integrals by subsitiution and properties of its :

$\int_{-2}^{3} \left|1 - x^2\right| dx = \dots\dots\dots\dots .$

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

B. $\frac{14}{3}$

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

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

Answer: A

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263. Evaluation of definite integrals by subsitiution and properties of its :

If $F(x) = f(x) + f\left(\frac{1}{x}\right)$ then where $f(x) = \int_1^x \frac{\log t}{1+t} dt, F(e) =$ ....

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

B. 0

C. 1

D. 2

Answer: A

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264. Evaluation of definite integrals by substitution and properties of its :

$$\int_{-\pi}^{\pi} \frac{\cos^2 x}{1 + a^x} dx = \text{..........} \ (a > 0)$$

A. $a\pi$

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

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

D. 2π

Answer: B

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265. Evaluation of definite integrals by subsitiution and properties of its :

$$\int_{-2}^{0}\left(x^3+3x^2+3x+3+(x+1)\cos(x+1)\right)dx = \ldots\ldots\ldots\ldots\ldots$$

A. -4

B. 0

C. 4

D. 6

Answer: C

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266. Evaluation of definite integrals by subsitiution and properties of its :

$f:R\rightarrow R$ is a differentiable function. If f(1)=4 then

$$\lim_{x\rightarrow 1}\int_{4}^{f(x)}\frac{2t}{x-1}dt = \ldots\ldots\ldots\ldots .$$

A. 8f'(1)

B. 4f'(1)

C. 2f'(1)

D. f'(1)

Answer: A

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267. Evaluation of definite integrals by subsitiution and properties of its :

$\int_0^1 \frac{e^t}{t+1}dt = a$ then $\int_{b-1}^{b} \frac{e^{-t}}{t-b-1}dt = \ldots\ldots\ldots\ldots$.

A. ae^{-b}

B. $-ae^{-b}$

C. be^{-b}

D. None of these

Answer: B

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268. Evaluation of definite integrals by subsitiution and properties of its :

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

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

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

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

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

Answer: B

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269. If $I = \int \frac{dx}{\sqrt{x + \sqrt{x + \sqrt{x + \ldots\ldots\infty}}}} = \ldots\ldots$

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270. Evaluation of definite integrals by subsitiution and properties of its :

$\int_0^{100\pi} \sqrt{1 - \cos 2x} dx = \ldots\ldots\ldots\ldots$.

A. $100\sqrt{2}$

B. $200\sqrt{2}$

C. $50\sqrt{2}$

D. None of these

Answer: B

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271. Evaluation of definite integrals by subsitiution and properties of its :

$f: R \rightarrow R$ is a differentiable function.f(2)=6, $f'(2) = \frac{1}{48}$ then

$$\lim_{x \rightarrow 2} \int_6^{f(x)} \frac{4t^3}{x-2} dt = \dots\dots\dots\dots .$$

A. 18

B. 12

C. 36

D. 24

Answer: A

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272. Evaluation of definite integrals by subsitiution and properties of its :

$$\int_{-4}^{4} |x+2| dx = \dots\dots$$

A. 50

B. 24

C. 30

D. 20

Answer: A

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273. Evaluation of definite integrals by subsitiution and properties of its :

$\int_0^1 \frac{dx}{\sqrt{1+x^4}} \in [a, b]$ then [a,b] =......... where [a,b] is the smallest interval.

A. $\left[\frac{1}{\sqrt{2}}, 1\right]$

B. [0,1]

C. $\left[\frac{1}{2}, 2\right]$

D. $\left[\frac{3}{4}, 1\right]$

Answer: A

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274. Evaluation of definite integrals by subsitiution and properties of its :

$$\int_0^{\frac{\pi}{2}} \left|\sin\left(x - \frac{\pi}{4}\right)\right| dx = \ldots\ldots\ldots$$

A. $2 + \sqrt{2}$

B. $2 - \sqrt{2}$

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

D. 0

Answer: B

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275. Evaluation of definite integrals by subsitiution and properties of its :

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

A. 0

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

C. $\sqrt{2} - 1$

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

Answer: B

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276. Evaluation of definite integrals by substitution and properties of its :

If n is an integer $\int_0^{\pi} e^{\cos^2 x} \cos^3 (2n + 1) x dx = ...$

A. 1

B. -1

C. 0

D. π

Answer: C

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277. Evaluation of definite integrals by subsitiution and properties of its :

$\int_0^{\frac{\pi}{2}} (x - [\sin x])dx = ...$

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

B. $\frac{\pi^2}{8} - 1$

C. $\frac{\pi^2}{8} - 2$

D. None of these

Answer: A

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278. Evaluation of definite integrals by subsitiution and properties of its :

$\int_{-a}^{a}\sqrt{\frac{a-x}{a+x}}dx = k\pi$ then k =........

A. $-a$

B. $-2a$

C. 2a

D. a

Answer: D

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279. Evaluation of definite integrals by subsitiution and properties of its :

$\int_1^5 (|x-3| + 1 - x \mid)dx = ...$

A. 10

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

C. 21

D. 12

Answer: D

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280. If $(n-m)$ is odd and $|m| \neq |n|$ then $\int_0^\pi \cos mx \sin nx dx = ...$

A. $\frac{2n}{n^2 - m^2}$

B. 0

C. $\dfrac{2n}{m^2 - n^2}$

D. $\dfrac{2m}{n^2 - m^2}$

Answer: A

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281. Evaluation of definite integrals by subsitiution and properties of its :

$\int_0^{100\pi} \sqrt{1 - \cos 2x}\,dx = ...$.

A. $100\sqrt{2}$

B. $200\sqrt{2}$

C. $50\sqrt{2}$

D. None of these

Answer: B

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282. Evaluation of definite integrals by subsitiution and properties of its :

If $\int_{-1}^{4} f(x)dx = 4$ and $\int_{2}^{4}(3 - f(x)dx = 7$ then $\int_{2}^{-1} f(x)dx = ...$

A. 2

B. -3

C. -5

D. 0

Answer: C

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283. Evaluation of definite integrals by subsitiution and properties of its :

$\int_{0}^{2\pi} \cos^{99} x dx = ...$

A. 1

B. -1

C. 99

D. 0

Answer: D

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284. Evaluation of definite integrals by subsitiution and properties of its :

If f(x) is an odd function then $\int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} f(\cos x)dx = ...$

A. 0

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

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

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

Answer: C

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285. Evaluation of definite integrals by subsitiution and properties of its :

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

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

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

C. π

D. 2π

Answer: A

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286. Evaluation of definite integrals by subsitiution and properties of its :

If $f(x) = f(2 - x)$ then $\int_{0.5}^{1.5} x f(x) dx = ...$.

A. $\int_{0}^{1} f(x) dx$

B. $\int_{0.5}^{1.5} f(x) dx$

C. $2\int_{0.5}^{1.5} f(x) dx$

D. 0

Answer: B

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287. Evaluation of definite integrals by subsitiution and properties of its :

$\int_{1}^{5} [x - 3] dx = ...$ where [.] is maximum integer function.

A. 1

B. 2

C. 4

D. 8

Answer: B

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288. Evaluation of definite integrals by subsitiution and properties of its :

$\int_{-1}^{1}\log\left[x+\sqrt{x^2+1}\right]dx = \ldots\ldots\ldots$

A. 0

B. $\log 2$

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

D. None of these

Answer: A

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289. Evaluation of definite integrals by subsitiution and properties of its :

If $\int_0^a f(2a - x)dx = \mu$ and $\int_0^a f(x)dx = \lambda$ then $\int_0^{2a} f(x)dx = ...$

A. $2\lambda + \mu$

B. $\lambda + \mu$

C. $\mu - \lambda$

D. $\lambda - 2\mu$

Answer: B

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290. Evaluation of definite integrals by subsitiution and properties of its :

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

A. 5π

B. 25π

C. 75π

D. 150π

Answer: C

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291. Evaluation of definite integrals by subsitiution and properties of its :

$F(x) = \int_{x^2}^{x^3} \log t . dt (x > 0)$ then F'(x)= ....

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

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

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

D. None of these

Answer: A

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292. Evaluation of definite integrals by subsitiution and properties of its :

For real function $f, f(-x) = -f(x)$ and $\int_0^1 f(x)dx = 5$ then $\int_{-1}^0 f(t)dt = ...$

A. 10

B. 5

C. 0

D. -5

Answer: D

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293. Evaluation of definite integrals by subsitiution and properties of its :

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

A. 0

B. π

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

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

Answer: C

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294. Evaluation of definite integrals by subsitiution and properties of its :

$I_1 = \int_a^{\pi - a} xf(\sin x)dx$, $I_2 = \int_a^{\pi - a} f(\sin x)dx$ then $I_2 =$ ....

A. $\frac{\pi}{2}I_1$

B. πI_1

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

D. $2I_1$

Answer: C

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295. Evaluation of definite integrals by subsitiution and properties of its :

$f: R \to R$ is a differentiable function.f(2)=6, $f'(2) = \frac{1}{48}$ then

$\lim_{x \to 2}\int_6^{f(x)} \frac{4t^3}{x - 2}dt =$ ....

A. 18

B. 12

C. 36

D. 24

Answer: A

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296. Evaluation of definite integrals by subsitiution and properties of its :

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

A. $1 - e^{-t}(1 + t)$

B. $e^t - (1 + t)$

C. te^t

D. te^{-t}

Answer: B

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297. Evaluation of definite integrals by substitution and properties of its :

$$\int_{-\pi}^{\pi} \frac{\cos^2 x}{1+a^x} dx = \dots\dots\dots\dots (a > 0)$$

A. 2π

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

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

D. $a\pi$

Answer: C

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298. Evaluation of definite integrals by subsitiution and properties of its :

$g(x) = \int_0^x f(t)dt$ where $\frac{1}{2} \leq f(t) \leq 1, t \in [0, 1]$ and $0 \leq f(t) \leq \frac{1}{2}, t \in (1, 2]$ then ....

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

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

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

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

Answer: B

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299. Evaluation of definite integrals by subsitiution and properties of its :

$$f(x) = \begin{vmatrix} \sin x + \sin 2x + \sin 3x & \sin 2x & \sin 3x \\ 3 + 4\sin x & 3 & 4\sin x \\ 1 + \sin x & \sin x & 1 \end{vmatrix}$$ then $\int_0^{\frac{\pi}{2}} f(x)dx = \dots\dots\dots$

A. 3

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

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

D. 0

Answer: C

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300. Evaluation of definite integrals by subsitiution and properties of its :

f is a function such that f'(x)=f(x) and f(0)=1g(x) is a function such that $g(x) + f(x) = x^2$ then $\int_0^1 f(x)g(x)dx = \dots\dots\dots$

A. $\frac{1}{4}(e - 7)$

B. $\frac{1}{4}(e - 2)$

C. $\frac{1}{2}(e - 3)$

D. None of these

Answer: D

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301. Evaluation of definite integrals by subsitiution and properties of its :

$\int_1^a [x]f'(x)dx = ...$ where $a > 1$ and [.] is a greatest integer function.

A. $[a]f(a) - \{f(1) + f(2) + ... + f[a]\}$

B. $[a]f([a]) - \{f(1) + f(2) + ... + f(a)\}$

C. $af(|a|) - \{f(1) + f(2) + ... + f(a)\}$

D. $af(a) - \{f(1) + f(2) + ... + f([a])\}$

Answer: A

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302. Evaluation of definite integrals by subsitiution and properties of its :

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

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

B. π^2

C. 0

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

Answer: B

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303. Evaluation of definite integrals by subsitiution and properties of its :

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

A. 0

B. e

C. e^e

D. e^2

Answer: C

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304. Evaluation of definite integrals by subsitiution and properties of its :

$\int_0^1 x(1 - x)^5 dx = \ldots\ldots\ldots$

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

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

C. $\frac{1}{42}$

D. $\frac{1}{13}$

Answer: C

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305. Evaluation of definite integrals by subsitiution and properties of its :

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

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

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

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

D. $-\pi$

Answer: C

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306. Evaluation of definite integrals by subsitiution and properties of its :

$\int_0^1 \frac{2x}{5x^2+1} dx = ...$

A. $\frac{1}{5}\log 6$

B. $\frac{1}{3}\log 5$

C. $\frac{1}{2}\log 6$

D. $\frac{1}{5}\log 3$

Answer: A

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307. Evaluation of definite integrals by subsitiution and properties of its :

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

A. -1

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

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

D. 0

Answer: D

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308. Evaluation of definite integrals by subsitiution and properties of its :

$\int_0^3 x\sqrt{1+x} dx = ...$

A. $\dfrac{112}{5}$

B. $\dfrac{106}{5}$

C. $\dfrac{116}{15}$

D. $\dfrac{15}{116}$

Answer: C

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309. Evaluation of definite integrals by subsitiution and properties of its :

$\int_1^2 e^{-\frac{1}{x}}\dfrac{dx}{x^2}$ = ...

A. $\dfrac{1}{e}+\dfrac{1}{e^2}$

B. $\dfrac{1}{e}+\dfrac{1}{\sqrt{e}}$

C. $\dfrac{1}{\sqrt{e}}-\dfrac{1}{e}$

D. $\dfrac{e+1}{\sqrt{e}}$

Answer: C

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310. Evaluation of definite integrals by subsitiution and properties of its :

$$\int_{-5}^{5}\left[3x^2 - x^{10}\sin x + x^5\sqrt{1 + x^2}\right]dx = \text{.........}$$

A. 486

B. 250

C. -100

D. 0

Answer: B

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311. Evaluation of definite integrals by subsitiution and properties of its :

$\int_a^{a+1} |a - x| dx = ...(a \in N)$

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

B. a

C. 0

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

Answer: A

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312. Evaluation of definite integrals by subsitiution and properties of its :

If $I_n = \int_{\pi/4}^{\pi/2} \cot^n x dx$, then $100\left(I_{99} + I_{101}\right) = ...$

A. 100

B. 0

C. 1

D. -1

Answer: C

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313. Evaluation of definite integrals by subsitiution and properties of its :

$$\int_{-e}^{e} \log\left(\frac{e^5 - x^5}{e^5 + x^5}\right) dx = \ldots\ldots\ldots\ldots$$

A. e

B. 5

C. 0

D. $-e$

Answer: C

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314. Evaluation of definite integrals by subsitiution and properties of its :

$$\int_{\pi/8}^{3\pi/8} \frac{1}{1+\sqrt{\tan x}}dx = \ldots\ldots\ldots$$

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

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

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

D. 0

Answer: B

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315. Evaluation of definite integrals by subsitiution and properties of its :

$$\int_0^{4028} \frac{f(x)}{f(x) + f(4028 - x)} dx = \text{............} .$$

A. 4028

B. 0

C. 2014

D. 8056

Answer: C

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316. Evaluation of definite integrals by subsitiution and properties of its :

$$\int_4^9 \frac{dx}{x - \sqrt{x}} = \text{.........}$$

A. $\log 2$

B. $\log 4$

C. $\log 3$

D. $-\log 2$

Answer: B

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317. Evaluation of definite integrals by subsitiution and properties of its :

If $\int \frac{1}{e^x + 1} dx = px - q\log\left|1 + e^x\right| + C$ then p+q=............

A. 0

B. 2

C. -2

D. 1

Answer: B

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318. Evaluation of definite integrals by subsitiution and properties of its :

$\int e^{x^3}.5^{x^2}.\,x[2\log 5 + 3x]dx = \ldots\ldots\ldots\ldots\ldots\ + C$

A. $e^{x^3}.5^{x^2}.\,x$

B. $\frac{1}{6}.\,e^{x^3}.5^{x^2}$

C. $\frac{1}{6}.\,e^{x^3}.5^{x^2}.\,x$

D. $e^{x^3}.5^{x^2}$

Answer: D

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319. Evaluation of definite integrals by subsitiution and properties of its :

$$\int \frac{dx}{\sqrt{2x - x^2}} = \dots\dots\dots + C$$

A. $2\sin^{-2}(x - 1)$

B. $\frac{1}{2}\sin^{-1}(x - 1)$

C. $\sin^{-1}(x - 1)$

D. $\log\left|(x - 1) + \sqrt{2x - x^2}\right|$

Answer: C

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320. $\int_{-1}^{\sqrt{3}} \frac{dx}{1 + x^2} = \dots\dots\dots$

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

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

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

D. $\frac{5\pi}{12}$

Answer: A

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321. Evaluation of definite integrals by subsitiution and properties of its :

$\int_0^{\pi} \cos^3 x . \sin^4 x dx = ...$

A. $-\pi$

B. 0

C. π

D. 2π

Answer: B

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322. Evaluation of definite integrals by subsitiution and properties of its :

$$\int_{-\frac{\pi}{6}}^{\frac{\pi}{6}} \sin^5 x \cos^2 x dx = \ldots\ldots\ldots .$$

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

B. 0

C. $\left(\frac{\pi}{6}\right)^5 - \left(\frac{\pi}{6}\right)^2$

D. $\left(\frac{\pi}{6}\right)^2 - \left(\frac{\pi}{6}\right)^5$

Answer: B

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323. Evaluation of definite integrals by subsitiution and properties of its :

$\int_0^2 f(x)dx = ...$ where $f(x) = \max\{x, x^2\}$

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

B. $\frac{13}{6}$

C. $\frac{17}{6}$

D. $\frac{19}{6}$

Answer: A

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324. Evaluation of definite integrals by subsitiution and properties of its :

If $f(a+b+1-x) = f(x) \forall x$ where a and b are fixed positive real numbers, then $\frac{1}{a+b}\int_a^b x(f(x) + f(x+1)dx =$ is equal to

A. $\int_{a-1}^{b-1} f(x)dx$

B. $\int_{a+1}^{b+1} f(x+1)dx$

C. $\int_{a-1}^{b-1} f(x+1)dx$

D. $\int_{a+1}^{b+1} f(x)dx$

Answer: C

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325. Evaluation of definite integrals by subsitiution and properties of its :

The value of α for which $4\alpha\int_{-1}^{2} e^{-\alpha|x|}dx = 5$, is :

A. $\log_e 2$

B. $\log_e \sqrt{2}$

C. $\log_e\left(\frac{4}{3}\right)$

D. $\log_e\left(\frac{3}{2}\right)$

Answer: A

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326. Evaluation of definite integrals by subsitiution and properties of its :

If θ_1 and θ_2 be respectively the smallest and the largest values of θ in $(0, 2\pi) - \{\pi\}$ which satisfy the equation, $2\cot^2\theta - \frac{5}{\sin\theta} + 4 = 0$, then $\int_{\theta_1}^{\theta_2}\cos^2 3\theta d\theta$ is equal to :

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

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

C. $\frac{\pi}{3} + \frac{1}{6}$

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

Answer: B

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PRACTICE PAPER-7 (SECTION-A)

1. $\int e^{x\log a} \cdot e^x dx = ... + c$

A. $\dfrac{(ae)^x}{1 + \log a}$

B. $\dfrac{a \cdot e^x}{1 + \log a}$

C. $\dfrac{a^x \cdot e}{1 + \log x}$

D. $\dfrac{(ax)^x}{1 + \log x}$

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2. $\int f(x)dx = \dfrac{(\log x)^5}{5} + c$ then $f(x) = ...$

A. $\dfrac{\log x}{x}$

B. $\dfrac{(\log x)^4}{x}$

C. $\dfrac{(\log x)^4}{4}$

D. $\frac{\log x}{x^4}$

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3. Answer the questions no.

$$\int \frac{2 - 3\sin x}{\cos^2 x} dx = \dots + c$$

A. $2\tan x + 3\sec x$

B. $2\sec x - 3\tan x$

C. $2\sec x + 3\tan x$

D. $2\tan x - 3\sec x$

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4. Evaluate the definite integral in exercise

$$\int_2^3 \frac{xdx}{x^2+1}$$

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

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

C. $\log 2$

D. $2\log 2$

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5. Evaluate the definite integrals

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

A. 0

B. 1

C. -1

D. Not obtain

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6. Integration of some particular functions :

$$\int \frac{x-2}{x^2-4x+3} dx = \dots . + c$$

A. $\log\sqrt{x^2-4x+3}$

B. $x\log(x-3)\log(x-2)$

C. $\log(x-3)(x-1)$

D. $\log\left(x^2+4x+3\right)$

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PRACTICE PAPER-7 (SECTION-B)

1. Answer the following question as required.

Find $\int \frac{dx}{3x^2 + 13x - 10}$

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

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3. $\int_0^{\pi} \frac{x}{1 + \sin x} dx$

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4. $\int_0^1 x(1 - x)^n dx$

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PRACTICE PAPER-7 (SECTION-C)

1. By using the properties of definite integrals evaluate the integrals in exercise.

$$\int_0^{\frac{\pi}{4}} \log(1 + \tan x)dx$$

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2. Find $\int\left[\sqrt{\cot x} + \sqrt{\tan x}\right]dx$

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3. Evaluate the following definite intergrals

$$\int_{-1}^{2} \left|x^3 - x\right| dx$$

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4. Answer the following questions as required.

Find $\int\left(x^2+1\right)\log x dx$

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PRACTICE PAPER-7 (SECTION-D)

1. Answer the following questions.

Find $\int_0^4\left(x+e^{2x}\right)dx$ as the limit of the sum.

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

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