



India's Number 1 Education App

MATHS

BOOKS - KC SINHA ENGLISH

INDEFINITE INTEGRALS - FOR COMPETITION

Solved Examples

1. Evaluate $\int \cos 9x dx$



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



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3. Evaluate: $\int \frac{1}{\sin^3 x \cos^5 x} dx$



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4. Evaluate: $\int \frac{\sqrt{\tan x}}{\sin x \cos x} dx$



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5. Evaluate:

$$\int \sin^4 x \cos^2 x dx$$



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6. Evaluate $\int \frac{dx}{\sin x}$



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7. Evaluate $\int \sec^6 x dx$ [Here power of $\sec x$ is even positive integer]



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8. Evaluate : $\int \cot^5 x dx$



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9. Evaluate: $\int \cot^5 x \cos ex^4 dx$



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10. Evaluate: $\int \tan^3 2x \cdot \sec 2x dx$



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11. Evaluate: $\int \tan^4 x dx$



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12. Evaluate: $\int \sec^2(x + \alpha) dx$



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



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14. Evaluate $\int \left(\frac{x^{1/2}}{x^{1/2} - x^{1/3}} \right) dx$



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15. Evaluate $\int \frac{dx}{\sqrt{1+x} + (1+x)^{1/3}}$



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



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17. Evaluate $\int \frac{\log\left(1 + \frac{1}{x}\right)}{x(1+x)} dx$



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



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



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20. $\int \frac{\sin^3 x}{(1 + \cos^2 x)\sqrt{1 + \cos^2 x + \cos^4 x}} dx$ is equal to



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21. Evaluate: $\int \frac{1}{\sqrt{\sin^3 x \sin(x + \alpha)}} dx, \alpha \neq n\pi, n \in \mathbb{Z}$



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22. Evaluate: $\int \frac{x^2 - 1}{x^3 \sqrt{2x^4 - 2x^2 + 1}} dx$



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23. Evaluate for, $m \in \mathbb{N}$,

$$\int (x^{3m} + x^{2m} + x^m) (2x^{2m} + 3x^m + 6)^{1/m} dx, x > 0.$$



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24. Evaluate: $\int (\sin x)^{\cos x} \left[\cos x \cot x - \log(\sin x)^{\sin x} \right] dx$



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25. Evaluate: $\int \frac{1}{\cos x + \cos ex} dx$



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



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



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28. Evaluate: $\frac{\sin^3 x dx}{(\cos^4 x + 3 \cos^2 x + 1) \tan^{-1}(\sec x + \cos x)}$



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29. $\int \frac{(x^{-7/6} - x^{5/6}) dx}{x^{1/3}(x^2 + x + 1)^{1/2} - x^{1/2}(x^2 + x + 1)^{1/3}}$



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30. Evaluate: $\int \frac{\sqrt{\cot x} - \sqrt{\tan x}}{1 + 3 \sin 2x} dx$



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31. Evaluate: $\int \frac{dx}{\sqrt{\sin(x + \alpha) \cos^3(x - \beta)}}$



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



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33.

If

$$\int (\sin 3\theta + \sin \theta) \cos \theta e^{\sin \theta} d\theta = (A \sin^3 \theta + B \cos^2 \theta + C \sin \theta + D \cos \theta + E)$$

then:



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34. Evaluate: $\int \frac{\cos x (1 + 4 \cos 2x)}{\sin x + 4 \sin x \cos^2 x} dx$



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35. Evaluate: $\int \left(x + \frac{1}{x}\right)^{n+5} \left(\frac{x^2 - 1}{x^2}\right) dx$



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36. If $\int \sqrt{\operatorname{cosec}x + 1} dx = k \operatorname{fog}(x) + c$, where k is a real constant, then



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37. Evaluate: $\int \frac{x + x^{\frac{2}{3}} + x^{\frac{1}{6}}}{x(1 + x^{\frac{1}{3}})} dx$ equals



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38. Evaluate: $\int \frac{1}{\cos^6 x + \sin^6 x} dx$



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39. Evaluate $\int \frac{dx}{(5 + 4 \cos x)^2}$.



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40. Evaluate: $\int \frac{\cos \theta}{(5 + 4 \cos \theta)^2} d\theta$



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41. Evaluate: $\int \frac{a + b \cos x}{(b + a \cos x)^2} dx$



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42. Evaluate $\int \frac{\sin^3(\theta/2) d\theta}{\cos \theta / 2 \sqrt{\cos^3 \theta + \cos^2 \theta + \cos \theta}}.$



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43. Evaluate: $\int \frac{x^2 - 1}{x \sqrt{(x^2 + \alpha x + 1)(x^2 + \beta x + 1)}} dx$



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



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45. Evaluate

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



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46. Evaluate $\int \frac{\tan\left(\frac{\pi}{4}-x\right)}{\cos^2 x \sqrt{\tan^3 x + \tan^2 x + \tan x}} dx.$



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47. The value of $\int \sqrt{\frac{\sin x - \sin^3 x}{1 - \sin^3 x}} dx$ is equal to (A) $\sin^{-1} \sin^{\frac{3}{2}} x + C$ (B) $\frac{2}{3} \sin^{-1} (\sin^{\frac{3}{2}} x) + C$ (C) $-\frac{2}{3} \cos^{-1} (\sin^{\frac{3}{2}} x) + C$ (D) none of these



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48. Evaluate: $\int \frac{dx}{2x^2 + 3x + 5}$

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

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

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51. Evaluate: $\int \sqrt{\cos ec^2 x - 2} dx$

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52. Evaluate: $\int \frac{\sqrt{\cos 2x}}{\sin x} dx$



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



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54. The value of $\int e^{\tan \theta} (\sec \theta - \sin \theta) d\theta$ is equal to



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55. $I = \int \left(\frac{\ln x - 1}{(\ln x)^2 + 1} \right) dx$ is equal to:



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56. $\int e^x \left(\frac{2 \tan x}{1 + \tan x} + \cot^2 \left(x + \frac{\pi}{4} \right) \right) dx$ is equal to



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



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



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59. Evaluate $\int \frac{x^2 + n(n-1)}{(x \sin x + n \cos x)^2} dx.$



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60. Evaluate $\int \left\{ \log\left(\frac{1 + \sin 2\theta}{1 - \sin \theta}\right)^{\cos^2 \theta} + \log\left(\frac{\cos 2\theta}{1 + \sin 2\theta}\right) \right\} d\theta.$



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61. $\int \frac{x^2(x \sec^2 x + \tan x)}{(x \tan x + 1)^2}$



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62. Evaluate the following integral :

$$\int e^{(x \sin x + \cos x)} \left\{ \frac{x^4 \cos^3 x - x \sin x + \cos x}{x^2 \cos^2 x} \right\} dx$$



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63. Evaluate the following integral :

$$\int e^{(x \sin x + \cos x)} \left\{ \frac{x^4 \cos^3 x - x \sin x + \cos x}{x^2 \cos^2 x} \right\} dx$$



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64. Evaluate: $\int \frac{x^2 + 42}{(x \sin x + 7 \cos x)^2} dx$



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65. Evaluate: $\int \frac{(x - \sin x)^{\frac{3}{2}}}{\sqrt{x}} \left\{ \frac{6x^2 \sin^2\left(\frac{x}{2}\right)}{x - \sin x} + 3x \right\} dx$



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66. Evaluate: $\int \tan^{-1} \sqrt{\sqrt{x} - 1} dx$



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67. Evaluate: $\int \frac{x^2 + 6}{(x \sin x + 3 \cos x)^2} dx$



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68. Evaluate : $\int \frac{\log_e 1 + \sin^2 x}{\cos^2 x} dx$



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



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



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



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



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73. Evaluate : $\int \frac{f(x)}{x^3 - 1} dx$ where $f(x)$ is a polynomial of second degree in x such that $f(0) = f(1) = 3f(2) = - 3$.



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74. Evaluate $\int \sqrt[3]{\tan x} dx$



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75. Evaluate: $\int \frac{dx}{(2x + 3)\sqrt{4x + 5}}$



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76. Find $\int \frac{dx}{(x - 1)\sqrt{x^2 - 1}}$

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

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

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

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80. Evaluate: $\int dx/x(x^5 + 1)$ dx is equal to :



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81. Evaluate $\int dx / ((1+x^2))$



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



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



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84. Obtain the reduction formula for $\int \cos^n x dx$



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85. Write a value of $\int e^{ax} \sin bx dx$



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86. Find the value of $\int 1/2x - 2/x + 3/\sqrt{x} dx'$



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87. If $\frac{d}{dx} f(x) = f'(x)$, then $\int \frac{xf'(x) - 2f(x)}{\sqrt{x^4 f(x)}} dx$ is equal to



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88. $\int x \log x (\log x - 1) dx =$ (A) $\frac{x^2}{2}(\log x - 1)^2 dx =$ (B) $(x \log x)^2 + c$
(C) $\frac{1}{2}(x \log x + 1)^2 + c$ (D) $2(x \log x - x)^2 + c$



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89. If $I = \int \frac{e^x}{e^{4x} + e^{2x} + 1} dx$. $J = \int \frac{e^{-x}}{e^{-4x} + e^{-2x} + 1} dx$. Then for an arbitrary constant c, the value of $J - I$ equal to



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90. Let $f(x) = \frac{x}{(1+x^n)^{1/n}}$ for $n \geq 2$ and $g(x) = \underbrace{f \circ f \circ \dots \circ f}_{n \text{ times}}(x)$, then $\int x^{n-2} g(x) dx$ equals to



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91. The integral $\int e^x (f(x) + f'(x)) dx$ can be solved by using integration by parts such that:

$$I = \int e^x f(x) dx + \int e^x f'(x) dx = e^x f(x) - \int e^x f'(x) dx + \int e^x f'(x) dx =$$

, and $\int e^{ax} \left(f(x) + \frac{f'(x)}{a} \right) dx = e^{ax} \frac{f(x)}{a} + C$,Now answer the question: $\int e^x x^x (2 + \log x) dx$ = (A) $e^x x^x \log x + C$ (B) $e^x + x^x + C$ (C) $e^x x (\log x)^2 + C$ (D) $e^x \cdot x^x + C$



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92. The integral $\int e^x (f(x) + f'(x)) dx$ can be solved by using integration by parts such that:

$$I = \int e^x f(x) dx + \int e^x f'(x) dx = e^x f(x) - \int e^x f'(x) dx + \int e^x f'(x) dx = , \text{ and } \int e^{ax} \left(f(x) + \frac{f'(x)}{a} \right) dx = e^{ax} \frac{f(x)}{a} + C$$

, Now answer the question: $\int \left\{ \log_e (\log_e x) + \frac{1}{(\log_e x)^2} \right\} dx$ is equal to (A)

$$\log_e (\log_e x) + C \quad (B) \quad x \log_e (\log_e x) - \frac{x}{\log_e x} + C \quad (C)$$

$$\frac{x}{\log_e x} - \log_e x + C \quad (D) \quad \log_e (\log_e x) - \frac{x}{\log_e x} + C$$



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93. The integral $\int e^x (f(x) + f'(x)) dx$ can be solved by using integration by parts such that:

$$I = \int e^x f(x) dx + \int e^x f'(x) dx = e^x f(x) - \int e^x f'(x) dx + \int e^x f'(x) dx = , \text{ and } \int e^{ax} \left(f(x) + \frac{f'(x)}{a} \right) dx = e^{ax} \frac{f(x)}{a} + C$$

, Now answer the question: $\int \frac{e^x (2 - x^2)}{(1 - x)\sqrt{1 - x^2}} dx$ (A) $e^x \sqrt{\frac{1 - x}{1 + x}} + C$ (B) $e^x \sqrt{\frac{1 + x}{1 - x}} + C$

(C) $e^x \sqrt{\frac{2 - x}{2 + x}} + C$ (D) none of these



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Exercise

1. Evaluate: $\int \sin^2 x \cos^5 x \, dx$



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2. $\int \cos^6 x \sin^3 x \, dx$



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3. $\int \sec^{\frac{3}{4}} x \cos e \sec^{\frac{5}{4}} x \, dx$



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4. $\int \sin^3 2x \cos^4 2x \, dx$



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5. $\int \frac{dx}{\sin^4 x \cos^4 x}$



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6. Evaluate: $\int \frac{dx}{\sin^{11} x \cos x^3}$



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7. Evaluate: $\int \tan^5 x dx$



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8. Evaluate $\int \sin^4 x dx$.



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$$9. \int \sin^8 x dx$$



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$$10. \int \cos^8 x \sin x dx$$



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$$11. \text{ If } \int \sqrt{\frac{\cos^3 x}{\sin^{11} x}} dx = -2 \left(A \tan^{-\frac{9}{2}} + B \tan^{-\frac{5}{2}} x \right) + C, \text{ find then find}$$

A and B.



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$$12. \int \sqrt{\tan x} \sec x \cos ec x dx$$



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



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14. Evaluate: $\int \frac{dx}{\cos^3 x \sqrt{s \in 2x}}$



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15. Evaluate $\int \sec^6 x dx$ [Here power of $\sec x$ is even positive integer]



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16. $\int \sec^4\left(\frac{x}{2}\right) \tan\left(\frac{x}{2}\right) dx$



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17. $\int \tan^5 \theta \sec^4 d\theta$



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18. Evaluate: $\int \sec^n x \tan x \, dx$



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19. Evaluate: $\int \cot^n x \cos ex^2 \, dx, n \neq -1$



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20. $\int \cot^4 x \, dx$



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21. Evaluate: $\int \tan^5 x \, dx$



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$$22. \int \frac{\sin^2 x}{(1 + \cos x)^2} dx$$

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$$23. \int \tan^m x \sec^4 x dx$$

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$$24. \int \frac{dx}{a \sin x + b \cos x}$$

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$$25. \text{Evaluate: } \int \frac{1}{\sin x + \cos x} dx$$

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$$26. \int \frac{\sec x}{b + a \tan x} dx$$



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$$27. \int \tan 2x \tan 5x \tan 7x dx$$



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$$28. \int \frac{dx}{\sec x + \cos ex}$$



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$$29. \int \frac{dx}{\sin x + \tan x}$$



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$$30. \text{Evaluate: } \int \frac{1}{\sin x \cos^2 x} dx$$



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$$31. \int \frac{dx}{\sqrt{13 + 5 \cos x - 12 \sin x}}$$



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$$32. \int \tan x \tan 2x \tan 3x dx$$



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$$33. \text{Evaluate: } \int \tan(x - \theta) \tan(x + \theta) \tan 2x \, dx$$



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$$34. \int \frac{\cos x}{\sqrt{1 + \cos x}} dx$$



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$$35. \int \frac{dx}{\cos x \cos(x + \alpha)}$$



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$$36. \int \frac{\sin 2x}{\sin(x - \alpha)\sin(x + \alpha)} dx$$



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



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$$38. \int \frac{dx}{\sin^2 x \cos x}$$



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39. Evaluate the following integration

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



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$$40. \int \frac{\cos x}{\sin^2 x} (1 - 3 \cos^3 x) dx$$



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$$41. \text{Evaluate: } \int \left(e^{5(\log_e x)} - \frac{e^{4(\log_e x)}}{e^{3(\log_e x)} - e^{2 \log x}} \right) dx$$



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$$42. \text{Evaluate: } \int \frac{\cos 2x - \cos 2\alpha}{\cos x - \cos \alpha} dx.$$



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$$43. \int \frac{5 \cos^3 x + 7 \sin^3 x}{3 \sin^2 x \cos^2 x} dx$$



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$$44. \int \frac{a^x + a^{2x}}{a^{4x}} dx$$

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$$45. \text{Evaluate } \int \sec^2 x \cos^2(2x) dx$$

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$$46. \int \frac{\cos 7x - \cos 8x}{\cos 2x - \cos 3x} dx$$

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$$47. \int \frac{2x^4 + 5}{x^2 + 1} dx$$

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$$48. \text{Evaluate the following integral : } \int \frac{x^6 + 1}{x^2 + 1} dx$$



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$$49. \int \frac{x^4}{1+x^2} dx$$



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$$50. \int \frac{x^4}{(1+x^2)^2} dx$$



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$$51. \text{Evaluate: } \int \frac{x^4 + 1}{x^2 + 1} dx$$



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$$52. \int \frac{(1+x)^2}{x^3+x} dx$$



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$$53. \int \frac{dx}{(x^2 + a^2)(x^2 + b^2)}$$



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$$54. \int \frac{dx}{1 + \sec x}$$



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55. Integrate the following:

$$\int \left\{ \frac{5 \cos^3 x + 2 \sin^3 x}{2 \sin^2 x \cdot \cos^2 x} + \sqrt{1 + \sin 2x} + \frac{1 + 2 \sin x}{\cos^2 x} + \frac{1 - \cos 2x}{1 + \cos 2x} \right\} dx$$



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$$56. \int \frac{dx}{\{(x - 5) + (x - 7)\}\sqrt{(x - 5)(x - 7)}}$$



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$$57. \int \frac{\sin^3 x + \sin^5 x}{\cos^2 x + \cos^4 x} dx$$



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$$58. \int \frac{5x - 2}{\sqrt{3x + 7}} dx$$



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$$59. \int \frac{x + 2}{(x + 1)^2} dx$$



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$$60. \int \frac{x^2}{\sqrt{1-x}} dx$$



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$$61. \int \frac{1 + \sqrt{x}}{1 + \sqrt[3]{x}} dx$$



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$$62. \int \frac{dx}{\sqrt{x+1} - \sqrt[4]{x+1}}$$



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$$63. \int \frac{dx}{(1+x)^{\frac{1}{2}} - (1+x)^{\frac{1}{3}}}$$



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$$64. \int \frac{1 + x^{\frac{1}{2}} + x^{\frac{2}{3}}}{1 + x^{\frac{1}{3}}} dx$$



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$$65. \int \frac{dx}{x^{\frac{1}{2}} + x^{\frac{1}{3}} + x^{\frac{2}{3}}}$$



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66. Evaluate: (i) $\int \frac{\sin \sqrt{x}}{\sqrt{x}} dx$ (ii) $\int \frac{(x+1)e^x}{\sin^2(x e^x)} dx$



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67. $\int \frac{\cos(\sqrt{x} - 3)}{\sqrt{x}} dx$



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68. $\int \frac{\cos(\log x)}{x} dx$



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69. $\int \frac{\cos \sqrt{ax+b}}{\sqrt{ax+b}} dx$



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$$70. \int \frac{\sin^3(3 + 2 \log x)}{x} dx$$

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$$71. \text{Evaluate: } \int \frac{\sin 2x}{a^2 + b^2 \sin^2 x} dx$$

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$$72. \text{Evaluate: } \int \frac{1+x^2}{x^2} e^{x - \frac{1}{x}} dx$$

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$$73. \int \frac{dx}{x + \sqrt{x}}$$

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



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75. Evaluate: $\int \frac{\tan^2 x \sec^2 x}{1 + \tan^6 x} dx$



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76. Evaluate: $\int \frac{dx}{x \log x \log(\log x)}$



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



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



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$$79. \int \frac{dx}{x\sqrt{x^{2n} - a^{2n}}}$$



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$$80. \int \frac{x^3}{(1 + x^2)^2} dx$$



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$$81. \int x^3 (1 - x^2)^{\frac{5}{2}} dx$$



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$$82. \int \sqrt{\sec x + 1} dx$$



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



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



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85. Evaluate: $\int \frac{1 + \cos \theta}{\theta + \sin \theta} d\theta$



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86. Evaluate $\int \frac{\tan x}{\sec x + \tan x} dx$



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



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88. Choose the correct answers $\int \frac{dx}{e^x + e^{-x}}$ is equal to
(A) $\tan^{-1}(e^x) + C$
(B) $\tan^{-1}(e^{-x}) + C$ (C) $\log(e^x - e^{-x}) + C$ (D) $\log(e^x + e^{-x}) + C$



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89. Evaluate: $\int \sec x (\sec x + \tan x) dx$



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



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



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$$92. \int \frac{e^x}{e^x + e^{-x}} dx$$



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$$93. \int \frac{(x+1)(x+\log x)^2}{2x} dx$$



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$$94. \text{Evaluate } \int \frac{\sin 2x}{(a+b\cos x)^2} dx$$



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$$95. \text{Evaluate: } \int \frac{10x^9 + 10^x (\log_e 10)}{10^x + x^{10}} dx$$



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



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



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



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



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



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101. $\int \frac{x^2}{(a^2 + x^2)^2} dx$



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



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103. $\int \frac{x}{\sqrt{a^4 - x^4}} dx$



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$$104. \int \frac{\sqrt{x}}{\sqrt{a^2 - x^3}} dx$$

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$$105. \text{Evaluate: } \int x \sqrt{\frac{a^2 - x^2}{a^2 + x^2}} dx$$

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$$106. \text{Evaluate: } \int \frac{1}{\sqrt{1 - e^{2x}}} dx$$

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$$107. \int \frac{dx}{x(1 + x^2)}$$

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$$108. \int \frac{x^{34}}{1+x^{14}} dx$$



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$$109. \int \sqrt{\frac{1+x}{1-x}} dx$$



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$$110. \int \frac{dx}{(1+x^2)\sqrt{1-x^2}}$$



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$$111. \int x \sqrt{\frac{1-x}{1+x}} dx$$



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$$112. \int \frac{x^2}{\sqrt{1 - x^2}} dx$$



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$$113. \int \frac{x^2}{\sqrt{1 + x^2}} dx$$



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$$114. \int \frac{x^2 + 1}{\sqrt{x^2 + 4}} dx$$



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$$115. \int (x + 2) \sqrt{x^2 - 1} dx$$



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$$116. \int (x+1) \sqrt{\frac{x+2}{x-2}} dx$$



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$$117. \int (x-2) \sqrt{\frac{1+x}{1-x}} dx$$



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$$118. \int \sqrt{\frac{e^x + 1}{e^x - 1}} dx \quad (A) \ln\left(e^x + \sqrt{e^{2x} - 1}\right) - \sec^{-1}(e^x) + C$$

$$(B) \ln\left(e^x + \sqrt{e^{2x} - 1}\right) + \sec^{-1}(e^x) + C$$

$$(C) \ln\left(e^x - \sqrt{e^{2x} - 1}\right) - \sec^{-1}(e^x) + C$$

$$(D) \ln\left(e^x + \sqrt{e^{2x} - 1}\right) - \sin^{-1}(e^{-x}) + C$$



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$$119. \int \frac{\cos x}{\sqrt{\sin^2 x + 3 \sin x + 4}} dx$$



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$$120. \int \frac{dx}{x \left[(\log x)^2 + 4 \log x - 1 \right]}$$



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$$121. \int \sqrt{\frac{x}{1+x}} dx$$



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$$122. \int \sqrt{\frac{a+x}{x-a}} dx$$



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$$123. \int \frac{dx}{x + \sqrt{x-1}}$$



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$$124. \int \sqrt{\frac{x-a}{b-x}} dx$$



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$$125. \int \frac{dx}{x\sqrt{1+x^n}}$$



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$$126. \int \sqrt{\frac{1+x^2}{x^2-x^4}} dx$$



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$$127. \int \sqrt{\frac{1-x}{1+x}} \cdot \frac{1}{x} dx$$



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128. Evaluate $\int \frac{dx}{\cos x \sqrt{\cos 2x}}$.



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129. The value of $\int \frac{(x - 1)}{(x + 1)\sqrt{x^3 + x^2 + x}} dx$, is



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



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131. $\int \frac{dx}{(1 + \sqrt{x})\sqrt{(x - x^2)}}$ is equal to (a) $\frac{1 + \sqrt{x}}{(1 - x)^2} + c$ (b) $\frac{1 + \sqrt{x}}{(1 + x)^2} + c$
(c) $\frac{1 - \sqrt{x}}{(1 - x)^2} + c$ (d) $\frac{2(\sqrt{x} - 1)}{\sqrt{(1 - x)}} + c$



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$$132. \int \frac{2 \tan x + 3}{\sin^2 x + 2 \cos^2 x} dx$$



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$$133. \text{ Evaluate : } \int \frac{dx}{\sin x + \sec x}$$



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$$134. \text{ Evaluate: } \int \frac{x}{\sqrt{x^2 + x + 1}} dx$$



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$$135. \text{ Evaluate: } \int \frac{x}{x^4 + x^2 + 1} dx$$



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$$136. \int \frac{2x + 3}{\sqrt{1 + x + x^2}} dx$$



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137. Evaluate: $\int \sqrt{7x - 10 - x^2} dx$



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138. $\int \frac{\sin x}{\sqrt{\sin^2 x + \cos x + 2 \cos^2 x}} dx$



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



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



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$$141. \int \frac{dx}{\cos \alpha + \cos x}$$



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$$142. \text{Evaluate: } \int \frac{1}{1 + \tan x} dx$$



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$$143. \text{Evaluate: } \int \frac{\sin x + 2 \cos x}{2 \sin x + \cos x} dx$$



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$$144. \int \frac{dx}{3 + 4 \sin x}$$



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$$145. \int \frac{dx}{3 \sin x - 4 \cos x + 5}$$



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$$146. \int \frac{dx}{4 \tan x + 4 \cot x}$$



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$$147. \int \frac{dx}{4 \sin^2 x + 9 \cos^2 x}$$



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$$148. \int \frac{dx}{(a \sin x + b \cos x)^2}$$



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$$149. \int \frac{\sin^2 x}{a + b \cos^2 x} dx$$



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$$150. \int \frac{\cos x dx}{(2 + \sin x)(1 - \sin x)}$$



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$$151. \int \frac{\sin x dx}{(2 + \cos x)(3 - \cos x)}$$



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$$152. \int e^x \left[\frac{x^3 + x + 1}{(1 + x^2)^{\frac{3}{2}}} \right] dx$$



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$$153. \text{Evaluate: } \int e^x (\tan x - \log \cos x) dx$$



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$$154. \int \frac{e^x \left[1 + \sqrt{1 - x^2} \sin^{-1} x \right]}{\sqrt{1 - x^2}} dx$$



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$$155. \text{ Evaluate: } \int e^x \frac{x^2 + 1}{(x + 1)^2} dx$$



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$$156. \text{ Evaluate: } \int \frac{e^x (2 - \sin 2x)}{1 - \cos 2x} dx$$



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$$157. \int \frac{e^{-\frac{x}{2}} \sqrt{1 - \sin x}}{1 + \cos x} dx$$



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



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



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



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



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$$162. \int \frac{e^{\cot x}}{\sin^2 x} (2 \ln \cosec x + \sin 2x) dx$$



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$$163. \int x \left(\frac{\sec 2x - 1}{\sec 2x + 1} \right) dx$$



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$$164. \int e^{4x} \sin 3x dx$$



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$$165. \int e^{\log_e x} \cos x dx$$



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$$166. \text{Evaluate: } \int \sin^{-1} \sqrt{\frac{x}{a+x}} dx.$$



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$$167. \int \cos 2x \log \sin x dx$$



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$$168. \int \frac{\sin(\log x)}{x^3} dx$$



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$$169. \int \cos \left(b \log \left(\frac{x}{a} \right) \right) dx$$



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$$170. \int e^{m \sin^{-1} x} dx$$



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$$171. \int \frac{e^{m \tan^{-1} x}}{(1 + x^2)^2} dx$$



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$$172. \int \cos^{-1}\left(\frac{1}{x}\right) dx$$



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$$173. \int \frac{\log(1 + x)}{(2x + 1)^2} dx$$



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$$174. \int \log\left(\frac{1 + x^2}{x^3}\right) dx$$



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$$175. \int \log(1 - x^2) dx$$



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$$176. \text{Evaluate: } \int \log\left(x + \sqrt{x^2 + a^2}\right) dx$$



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$$177. \int \frac{\log x}{(x+1)^2} dx$$



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$$178. \int \frac{\log(1+x)}{x^2} dx$$



Watch Video Solution

$$179. \text{Evaluate: } \int (e^{\log x} + \sin x) \cos x dx$$



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$$180. \int \frac{\log(x^2 + a^2)}{x^2} dx$$



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$$181. \int x^3 e^{x^2} dx$$



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$$182. \text{Evaluate } \int \frac{x \sin^{-1} x}{\sqrt{1 - x^2}} dx$$



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$$183. \int \frac{x}{1 + \sin x} dx$$



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184. evaluate $\int 2e^x + 6x + \ln 2 dx$



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185. evaluate $\int \frac{x^2 + 3x - 2}{\sqrt{x}} dx$



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



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



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



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189. What is the integral of $\sec^{-1} x$?



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



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



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



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$$193. \int \frac{\sin^{-1} x}{(1 - x^2)^{3/4}} dx$$



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$$194. \int \frac{\log(\sec^{-1} x)}{x\sqrt{x^2 - 1}} dx$$



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$$195. \int \left(\frac{\cos x}{x} - \sin x \log x \right) dx$$



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$$196. \int \frac{\log \cos x}{\cos^2 x} dx$$



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197. evaluate $\int \frac{\sec^2 x}{\sqrt{16 + \tan^2 x}} dx$



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198. The value of $\int \frac{\log[x + \sqrt{1 + x^2}]}{\sqrt{1 + x^2}} dx$ is:



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199. evaluate $\int (\sin x + \cos x)^2 dx$



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200. evaluate $\int 2x \cos x^2 dx$



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$$201. \int \left(\sec^2 x \cos^{-1} x - \frac{\tan x}{\sqrt{1-x^2}} \right) dx$$



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$$202. \int x \log \left(1 + \frac{1}{x} \right) dx$$



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$$203. \int \sin x \log \tan x dx$$



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$$204. \text{If } I = \int e^{-x} \log(e^x + 1) dx, \text{ then } I \text{ equals}$$



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



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



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



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



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209. Evaluate: $\int \frac{\sin x}{\sin 4x} dx$



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$$210. \int \frac{(x-1)(x-2)(x-3)}{(x+1)(x+2)(x+3)} dx$$



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$$211. \int \frac{dx}{(x+1)(x^2+2x+2)}$$



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$$212. \int \frac{dx}{(x+1)^2(x^2+1)}$$



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$$213. \text{ Evaluate: } \int \frac{\tan^{-1} x}{1+x^2} dx$$



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$$214. \int \frac{1}{x} \sqrt{\frac{1-x}{1+x}} dx$$



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$$215. \text{ Evaluate: } \int \frac{x^3 - 1}{x^3 + x} dx$$



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$$216. \int \frac{\log(1+x)}{x^2} dx$$



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$$217. \int \frac{x^2 + x + 3}{(x-2)(x+1)} dx$$



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$$218. \int \frac{\cos x}{(1 + \sin x)^2(2 + \sin x)} dx$$



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$$219. \int \frac{\sin 2x}{\cos^2 x + 3 \cos x + 2} dx$$



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$$220. \int \frac{dx}{x^3 - 1}$$



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$$221. \int \frac{dx}{(x^2 + 1)^2}$$



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$$222. \int \frac{dx}{(x^2 + 1)^4}$$



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$$223. \int \frac{dx}{x\sqrt{x-1}}$$



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$$224. \int \frac{dx}{(x+2)\sqrt{x+3}}$$



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$$225. \int \frac{dx}{(x-1)\sqrt{x^2-1}}$$



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$$226. \int \frac{dx}{(1+x)\sqrt{3x^2+3x+1}}$$



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$$227. \int \frac{dx}{x^2\sqrt{x^2-1}}$$



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$$228. \int \frac{dx}{(x^2-1)\sqrt{x^2+1}}$$



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$$229. \int x^3(1+x^2)^{\frac{1}{3}}dx$$



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230. If $I_n = \int \frac{dx}{(x^2 + a^2)^n}$, $n \in N$, then show that:
 $I_{n+1} = \frac{1}{2na^2} \frac{x}{(x^2 + a^2)^n} + \frac{2n-1}{2n} \cdot \frac{1}{a^2} I_n$

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231. If $I_n = \int \sqrt{(a^2 + x^2)^n} dx$, Prove that:
 $I_n = \frac{x \sqrt{(a^2 + x^2)^n}}{n+1} + \frac{na^2}{n+1} \int (a^2 + x^2)^{\frac{n}{2}-1} dx$

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232. If $I_{m,n} = \int (\sin x)^m (\cos x)^n dx$ then prove that
 $I_{m,n} = \frac{(\sin x)^{m+1} (\cos x)^{n-1}}{m+n} + \frac{n-1}{m+1} \cdot I_{m,n-2}$

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233. The value of $\int \frac{1 + \log x}{\sqrt{(x^x)^2 - 1}} dx$ is



234. The value of the integral $\int \frac{x}{1+x \tan x} dx$ is equal to (A) $\log|x \cos x + \sin x| + c$ (B) $\log|\cos x + x|$ (C) $\log|\cos x + x \sin x| + c$ (D) none of these



235. The value of the integral $\int \frac{e^{5 \log x} - e^{4 \log x}}{e^{3 \log x} - e^{2 \log x}} dx$ is equal to
(A) $x^2 + c$
(B) $\frac{x^3}{3} + c$
(C) $\frac{x^2}{2} + c$
(D) none of these



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



237. The value of $\int \frac{f(x)\phi'(x) + \phi(x)f'(x)}{(f(x) \cdot \phi(x) + 1)\sqrt{\phi(x) \cdot f(x) - 1}} dx$ is (A) $\cos^{-1} \sqrt{f(x)^2 - \phi(x)^2}$ (B) $\tan^{-1}[f(x)\phi(x)]$ (C) $\sin^{-1} \sqrt{\frac{f(x)}{\phi(x)}}$ (D) none of these

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238. $\int \tan x \cdot \tan 2x \cdot \tan 3x dx$ is equal to

- (A) $\log \sin 3x + \log \sin 2x + \log \sin x + c$
 (B) $\log(\sec 3x \sec 2x \sec x) + c$
 (C) $\frac{1}{3}\log|\sec 3x| - \frac{1}{2}\log|\sec 2x| - \log|\sec x| + c$
 (D) none of these

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239. The value of $\int \sqrt{1 + \sec x} dx$ is equal to (A) $2\sin^{-1}\left(\sqrt{2}\sin\left(\frac{x}{2}\right)\right) + c$ (B) $2\cos^{-1}\left(\sqrt{2}\sin\left(\frac{x}{2}\right)\right) + c$ (C)

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

(D) none of these



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240. $\int e^x \left(\frac{x^3 + x + 1}{(1 + x^2)^{3/2}} \right) dx$ is equal to :



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



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242. If $\int \frac{x^2 - 2}{(x^4 + 5x^2 + 4)\tan^{-1}\left(\frac{x^2+2}{x}\right)} dx = \log|f(z)| + c$, then (A)

$f(z) = \tan^{-1} z$, where $z = \sqrt{x+2}$ (B) $f(z) = \tan^{-1} z$, where

$z = x + \frac{2}{x}$ (C) $f(z) = \sin^{-1} z$, where $z = \frac{x+2}{x}$ (D) none of these



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243. If $\int x \log(1 + 1/x) dx = f(x)\log(x+1) + g(x)x^2 + Ax + C$,

then



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244. $\int \frac{1}{\cos^6 x + \sin^6 x} dx$ is equal to

- (A) $\tan^{-1}(\tan x - \cot x) + c$
- (B) $\sin^{-1}(\sin 2x) + c$
- (C) $\tan^{-1}(\tan x + \cot x) + c$
- (D) $\cot^{-1}(\tan x + \cot x) + c$



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245. $\int \frac{\sin 5x}{\cos 7x \cos 2x} dx$ is equal to

- (A) $\log|\sec 7x| + c$
- (B) $\log|\sec 7x \sec 2x| + c$
- (C) $\log|\sec 7x + \sec 2x| + c$
- (D) none of these



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246. $\int \frac{x \cos x \log x - \sin x}{x(\log x)^2} dx$ is equal to (A) $\sin x + c$ (B) $\log x \sin x + c$
(C) $\log x + \sin x + c$ (D) none of these

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247. $\int \left(\frac{f(x)g'(x) - f'(x)g(x)}{f(x)g(x)} \right) (\log(g(x)) - \log(f(x))) dx$ is equal to:

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248. $\int \frac{dx}{\sqrt{x}(1+x^2)^{\frac{5}{4}}} =$
(A) $\frac{2x}{(1+x^2)^{\frac{1}{4}}} + c$ (B) $\frac{2\sqrt{x}}{(1+x^2)^{\frac{1}{4}}} + c$ (C) $\frac{2\sqrt{x}}{1+x^2} + c$ (D) none of these

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249. $\int \frac{dx}{(x-1)^{\frac{3}{4}}(x+2)^{\frac{5}{4}}} =$ (A) $\frac{4}{3} \left(\frac{x-1}{x+2} \right)^{\frac{1}{4}} + c$ (B) $\frac{4}{3} \sqrt{\frac{x-1}{x+2}} + c$
(C) $\frac{4}{3} \left(\frac{x+2}{x-1} \right)^{\frac{1}{4}} + c$ (D) none of these



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250. $\int \frac{x^2}{(x \sin x + \cos x)^2} dx = -\frac{x \sec x}{x \sin x + \cos x} + f(x) + c$, then $f(x)$ may be (A) $\sin x$ (B) $x \sin x$ (C) $\tan x$ (D) $\cot x$



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251. $\int \frac{e^x(1+x)}{\cos^2(xe^x)} dx =$ (a) $2(\log)_e \cos(xe^x) + C$ (b) $\sec(xe^x) + C$ (c) $\tan(xe^x) + C$ (d) $\tan(x + e^x) + C$



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



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



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254. $\int \frac{dx}{x(1+x^{10})} =$ (A) $\frac{1}{10} \log\left(\frac{1+x^{10}}{x^{10}}\right) + c$ (B)
 $\frac{1}{10} \log\left(\frac{x^{10}}{1+x^{10}}\right) + c$ (C) $\frac{1}{(1+x^{10})^2} + c$ (D) none of these



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255. $\int \frac{x+2}{(x^2+3x+3)\sqrt{x+1}} dx$ is equal to



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256. about to only mathematics



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

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258. $\int \frac{1 + \cos 4x}{\cot x - \tan x} dx$

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259. Evaluate: $\int e^x \frac{1 + nx^{n-1} - x^{2n}}{(1 - x^n)\sqrt{1 - x^{2n}}} dx$

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260. The value of the integral $\int \frac{\cos^3 x + \cos^5 x}{\sin^2 x + \sin^4 x} dx$ is
 $\sin x - 6 \tan^{-1}(\sin x) + C$ $\sin x - 2(\sin x)^{-1} + C$

$\sin x - 2(\sin x)^{-1} - 6 \tan^{-1}(\sin x) + C$

$\sin x - 2(\sin x)^{-1} + 5 \tan^{-1}(\sin x) + C$

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261. $\int \frac{x+1}{x(1+x e^x)^2} dx = \log|1-f(x)| + f(x) + c$, then $f(x) =$



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262. If $\int x \log(1 + 1/x) dx = f(x) \log(x+1) + g(x)x^2 + Ax + C$,

then



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263. If $\int \frac{\sqrt{\cot x}}{\sin x \cos x} dx = a\sqrt{\cot x} + b$, then (A) 1 (B) 2 (C) -1 (D) -2



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264. If $\int f(x) \cdot \cos x dx = \frac{1}{2}\{f(x)\}^2 + c$, then $f(0) =$

(A) 1

(B) 0

(C) -1

(D) none of these



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



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266. $\frac{xe^x}{(1+x)^2} dx =$ (A) $\frac{e^x}{1+x}$ (B) $\frac{e^x}{(1+x)^2}$ (C) $e^x \log(1+x)$ (D) none

of these



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267. If $\int \frac{\sin x}{\sin(x-\alpha)} dx = Ax + B \log \sin(x-\alpha) + C$, then value of (A, B) is (A) $(-\sin \alpha, \cos \alpha)$ (B) $(-\cos \alpha, \sin \alpha)$ (C) $(\sin \alpha, \cos \alpha)$ (D) $(\cos \alpha, \sin \alpha)$



268. $\int \frac{dx}{\cos x - \sin x}$ is equal to (A) $\frac{1}{\sqrt{2}} \log \left| \tan \left(\frac{x}{2} - \frac{3x}{8} \right) \right| + C$ (B)
 $\frac{1}{\sqrt{2}} \log \left| \cot \left(\frac{x}{2} \right) \right| + C$ (C) $\frac{1}{\sqrt{2}} \log \left| \tan \left(\frac{x}{2} - \frac{\pi}{6} \right) \right| + C$ (D)
 $\frac{1}{\sqrt{2}} \log \left| \tan \left(\frac{x}{2} + \frac{3\pi}{8} \right) \right| + C$



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269. If $\int \left[\frac{\log x - 1}{1 + (\log x)^2} \right]^2 dx = \frac{f(x)}{1 + (g(x))^2} + c$, then (A) $f(x) = x$ (B)
 $f(x) = x^2$ (C) $g(x) = \log x$ (D) $g(x) = (\log x)^2$



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270. $\int \frac{dx}{\cos x + \sqrt{3} \sin x}$ equals: (1) $\frac{1}{2} \log \tan \left(\frac{x}{2} + \frac{\pi}{12} \right) + c$ (2)
 $\frac{1}{2} \log \tan \left(\frac{x}{2} - \frac{\pi}{12} \right) + c$ (3) $\log \tan \left(\frac{x}{2} + \frac{\pi}{12} \right) + c$ (4)
 $\log \tan \left(\frac{x}{2} - \frac{\pi}{12} \right) + c$



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271. The value of $\sqrt{2} \int \frac{\sin x dx}{\sin\left(x - \frac{\pi}{4}\right)}$ is: (1) $x + \log|\cos\left(x - \frac{\pi}{4}\right)| + c$ (2)

$$x - \log|\sin\left(x - \frac{\pi}{4}\right)| + c \quad (3) \quad x + \log|\sin\left(x - \frac{\pi}{4}\right)| + c \quad (4)$$

$$x - \log|\cos\left(x - \frac{\pi}{4}\right)| + c$$



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272. If $\int \frac{x^4 + 1}{x^6 + 1} dx = \tan^{-1} f(x) - \frac{2}{3} \tan^{-1} g(x) + C$, then both $f(x)$ and $g(x)$ are odd functions $f(x)$ is monotonic function $f(x) = g(x)$

has no real roots $\int \frac{f(x)}{g(x)} dx = -\frac{1}{x} + \frac{3}{x^3} + c$



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



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274. $\int \frac{\log_e(x+1) - \log_e x}{x(x+1)} dx$ is equal to (A)
- $-\frac{1}{2} \left[\log(x+1)^2 - \frac{1}{2} \log x \right]^2 + \log_e(x+1) \log_e x + C$ (B)
- $-[(\log_e(x+1) - \log_e x)^2] (C) c - \frac{1}{2} \left(\log \left(1 + \frac{1}{x} \right) \right)^2$ (D) none of these



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275. If $\int \frac{x e^x}{\sqrt{1+e^x}} dx = f(x) \sqrt{1+e^x} - 2 \log g(x) + C$, then



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276. $\int \frac{4e^x + 6e^{-x}}{9e^x - 4e^{-x}} dx = Ax + B \log(9e^{2x} - 4) + C$, then A=_____ ,
B=_____, C=_____



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277. $\int \left\{ \frac{\log x - 1}{1 + (\log x)^2} \right\}^2 dx$ is equal to (A) $\frac{xe^x}{1+x^2} + C$ (B)
 $\frac{x}{1 + (\log x)^2} + C$ (C) $\frac{\log x}{(\log x)^2 + 1} + C$ (D) $\frac{xe^x}{1+x^2} + C$



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278. Statement-1: $\int \frac{dx}{x(1 + \log x)^2} = -\frac{1}{1 + \log x} + C$, Statement-2:
 $\int (f(x))^n f'(x) dx = \frac{(f(x))^{n+1}}{n+1} + C, n+1 \neq 0$ (A) Statement-1 is True,
 Statement-2 is True, Statement-2 is a correct explanation for Statement-1.

- (B) Statement-1 is True, Statement-2 is True, Statement-2 is NOT a correct explanation for Statement-1. (C) Statement-1 is True, Statement-2 is False.
 (D) Statement-1 is False, Statement-2 is True.



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279. Statement-1:
 $\int \frac{3 - 2x}{\sqrt{4 + 2x - x^2}} dx = 2\sqrt{4 + 2x - x^2} + \sin^{-1} \left(\frac{x-1}{\sqrt{5}} \right) + C$

,Statement-2: $\int \frac{dx}{\sqrt{a^2 - x^2}} = \frac{x}{2} \sqrt{(a^2 - x^2)} + \frac{a^2}{2} \sin^{-1}\left(\frac{x}{a}\right)$ (A)

Statement-1 is True, Statement-2 is True, Statement-2 is a correct explanation for Statement-1. (B) Statement-1 is True, Statement-2 is True, Statement-2 is NOT a correct explanation for Statement-1. (C) Statement-1 is True, Statement-2 is False. (D) Statement-1 is False, Statement-2 is True.



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280. Statement-1: The function $F(x) = \int \sin^2 x dx$ satisfies $F(x + \pi) = F(x), \forall \xi n R$,Statement-2: $\sin^2(x + \pi) = \sin^2 x$ (A)
Statement-1 is True, Statement-2 is True, Statement-2 is a correct explanation for Statement-1. (B) Statement-1 is True, Statement-2 is True, Statement-2 is NOT a correct explanation for Statement-1. (C) Statement-1 is True, Statement-2 is False. (D) Statement-1 is False, Statement-2 is True.



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281. Consider the function $F(x) = \int \frac{x}{(x-1)(x^2+1)} dx$

Statement-1: $F(x)$ is discontinuous at $x = 1$, Statement-2: Integrand of $F(x)$ is discontinuous at $x = 1$ (A) Statement-1 is True, Statement-2 is True, Statement-2 is a correct explanation for Statement-1. (B) Statement-1 is True, Statement-2 is True, Statement-2 is NOT a correct explanation for Statement-1. (C) Statement-1 is True, Statement-2 is False. (D) Statement-1 is False, Statement-2 is True.



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282. Let a solution $y = y(x)$ of the differential equation $x\sqrt{x^2 - 1}dy - y\sqrt{y^2 - 1}dx = 0$ satisfy $y(2) = \frac{2}{\sqrt{3}}$

Statement-1: $y(x) = \sec\left(\sec^{-1}x - \frac{\pi}{6}\right)$

Statement-2: $y(x)$ is given by $\frac{1}{y} = \frac{2\sqrt{3}}{x} - \sqrt{1 - \frac{1}{x^2}}$

(A) Statement-1 is True, Statement-2 is True, Statement-2 is a correct explanation for Statement-1. (B) Statement-1 is True, Statement-2 is True, Statement-2 is NOT a correct explanation for Statement-1. (C) Statement-1 is True, Statement-2 is False. (D) Statement-1 is False, Statement-2 is True.



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283. Statement-1: $\int \left(\frac{x^2 - 1}{x^2} \right) e^{\frac{x^2+1}{x}} dx = e^{\frac{x^2+1}{x}} + C$ Statement-2:
 $\int f(x) e^{f(x)} dx = f(x) + C$ (A) Statement-1 is True, Statement-2 is True,
Statement-2 is a correct explanation for Statement-1. (B) Statement-1 is
True, Statement-2 is True, Statement-2 is NOT a correct explanation for
Statement-1. (C) Statement-1 is True, Statement-2 is False. (D) Statement-1
is False, Statement-2 is True.



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284. Statement-1: $\int \sin^{-1} x dx + \int \sin^{-1} \sqrt{1-x^2} dx = \frac{\pi}{2} x + c$
Statement-2: $\sin^{-1} x + \cos^{-1} x = \frac{\pi}{2}$ (A) Statement-1 is True, Statement-
2 is True, Statement-2 is a correct explanation for Statement-1. (B)
Statement-1 is True, Statement-2 is True, Statement-2 is NOT a correct
explanation for Statement-1. (C) Statement-1 is True, Statement-2 is False.
(D) Statement-1 is False, Statement-2 is True.



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285. Statement-1: $\int (\sin x)^x (x \cot x + \log \sin x) dx = x(\sin x)^x$

Statement-2: $\frac{d}{dx} (f(x))^{g(x)} = (f(x))^{g(x)} \frac{d}{dx} [g(x) \log f(x)]$ (A)

Statement-1 is True, Statement-2 is True, Statement-2 is a correct explanation for Statement-1. (B) Statement-1 is True, Statement-2 is True, Statement-2 is NOT a correct explanation for Statement-1. (C) Statement-1 is True, Statement-2 is False. (D) Statement-1 is False, Statement-2 is True.



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286. The formula in which a certain integral involving some parameters is connected with some integrals of lower order is called a reduction formula. In most of the cases the reduction formula is obtained by the process of integrating by parts. Of course, in some cases the methods of differentiation are adopted. Now answer the question: If $I_{m-2, n+2} = \int \sin^{m-2} x \cos^{n+2} x dx$ and

$I_{m,n} = -\frac{\sin^{m-1} x \cos^{n+1} x}{n+1} + f(m, n) I_{m-2}$, then $f(2, 3)$ is equal to

- (A) $\frac{1}{2}$ (B) $\frac{1}{3}$ (C) $\frac{1}{4}$ (D) $\frac{1}{5}$



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287. Let n be a positive integer such that $I_n = \int x^n \sqrt{a^2 - x^2} dx$ Now answer the following question: The value of I_1 is (A) $\frac{2}{3}(a^2 - x^2)^{\frac{1}{2}}$ (B) $\frac{1}{3}(a^2 - x^2)^{\frac{3}{2}}$ (C) $-\frac{2}{3}(a^2 - x^2)^{\frac{3}{2}}$ (D) $-\frac{1}{3}(a^2 - x^2)^{\frac{3}{2}}$



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288. Let n be a positive integer such that $I_n = \int x^n \sqrt{a^2 - x^2} dx$ Now answer the following question: The value of I_1 is (A) $\frac{2}{3}(a^2 - x^2)^{\frac{1}{2}}$ (B) $\frac{1}{3}(a^2 - x^2)^{\frac{3}{2}}$ (C) $-\frac{2}{3}(a^2 - x^2)^{\frac{3}{2}}$ (D) $-\frac{1}{3}(a^2 - x^2)^{\frac{3}{2}}$



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289. Integral of the form $\int [xf'(x) + f(x)]dx$ can be evaluated by using integration by parts in first integral and leaving second integral as it is. Now answer the question: $\int \frac{x + \sin x}{1 + \cos x} dx =$ (A) $x \frac{\tan x}{2} + c$ (B) $\frac{x \tan x}{2} + c$ (C) $\frac{x}{2} \tan x + c$ (D) none of these



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290. Integral of the form $\int [xf'(x) + f(x)]dx$ can be evaluated by using integration by parts in first integral and leaving second integral as it is. Now answer the question: $\int [x^{x+1}(\log x + 1) + x^x] dx =$ (A) $x^{x+2} + c$ (B) $x^{x+1} + c$ (C) $x^x + x + c$ (D) none of these



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291. Integral of the form $\int [xf'(x) + f(x)]dx$ can be evaluated by using integration by parts in first integral and leaving second integral as it

is. Now answer the question: $\int \left[\frac{1}{x^4 + 1} - \frac{4x^4}{(x^4 + 1)^2} \right] dx =$ (A)

- $\frac{x^2}{x^4 + 1} + c$ (B) $\frac{x^3}{x^4 + 1} + c$ (C) $\frac{x}{x^4 + 1} + c$ (D) none of these



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292. Let $f: R \rightarrow R$ be a continuous function and $f(x) = f(2x)$ is true

$\forall x \in R$. If $f(1) = 3$, then the value of $\int_{-1}^1 f(f(x))dx$ is equal to



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293. If $f(x) = \int \frac{3x^4 - 1}{(x^4 + x + 1)^2} dx$ and $f(0) = 0$, then $f(-1) = \dots$



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294. If $n \in N$ and

$$\int (x^{7n} + x^{2n} + x^n)(2x^{6n} + 7x^n + 14)^{\frac{1}{n}} dx = \frac{(2x^{7n} + 7x^{2n} + 14x^n)^{\frac{n+1}{n}}}{k(n+1)} +$$

, then, k is equal to...



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295. If $\int \frac{4x^3 + a4^x}{4^x + x^4} dx = \log(x^4 + 4^x) + c$, then $e^a = ...$



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296. If $z = (x + 1)^{\frac{1}{6}}$ and
 $\int \frac{x}{(1+x)^{\frac{1}{3}} - \sqrt{1+x}} dx = a \left(\frac{z^4}{4} + \frac{z^5}{5} + \frac{z^6}{6} + \frac{z^7}{7} + \frac{z^8}{8} + \frac{z^9}{9} \right) + c$,
, then $|a| = ...$



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