



MATHS

BOOKS - BHARATI BHAWAN MATHS (HINGLISH)

Indefinite Integration of Rational and irrational functions

Example

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



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



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



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



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



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



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



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



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



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10.
$$\int \frac{dx}{\sqrt{(x - \alpha)(\beta - x)}}$$



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



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



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



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



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



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



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



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18. Evaluate $\int \log x dx$



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



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20. Evaluate: $\int \sqrt{\sec x + 1} dx$



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21. $\int \frac{\sqrt{\cos 2x}}{\sin x} dx$



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Exercise

1. $\int \frac{x + 1}{x^2 + 5x6} dx =$



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



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3. Integrate the following: $\int \frac{dx}{x^3 - 2x^2 - x + 2}$



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4. Integrate the following: $\int \frac{dx}{(x-2)(x-1)^2}$



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



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6. Evaluate: $\int \frac{dx}{(x-b)^3(x-a)^2}$



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7. Integrate the following: $\int \frac{dx}{1-x^4}$



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



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



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10. Integrate the following:

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



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

$$f(0) = f(1) = 3f(2) = -3$$



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



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13. Evaluate the following:

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



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14. Evaluate the following: $\int \frac{dx}{\cos x(1 + \cos^2 x)}$



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15. Evaluate $\int \frac{dx}{(\sin x - \sin 2x)}$.



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16. Evaluate the following: $\int \sec x \cdot \cos 2x dx$



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17. Evaluate the following: $\int \sin x \cdot \cos ecx dx$



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



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19. The value of the integral

$\int \frac{\cos^3 x + \cos^5 x}{\sin^2 x + \sin^4 x} dx$ is (A)

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

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

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

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



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$$20. \int \frac{\cos^2 x + \sin 2x}{(2 \cos x - \sin x)^2} dx$$



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$$21. \int \frac{x + 1}{x(1 + x e^x)^2} dx \text{ equals}$$



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



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



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



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



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26. $\frac{1}{4 + 5 \sin x}$



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



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



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29. Integrate the following:

$$\int \frac{d\theta}{3 \cos \theta + \sin \theta + 2}$$



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30. Evaluate the following integrals

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



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31. $\int \frac{\cos x}{\sin x + \cos x} dx =$



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



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$$33. \int \left(\frac{1 + \tan x}{1 - \tan x} \right) dx$$



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



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$$35. \int \frac{dx}{4 + \tan x + 4 \cot x}$$



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$$36. \int \frac{dx}{\sec x + \cos ecx}$$



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$$37. \int \frac{dx}{\sin x + \sec x}$$



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$$38. \int \frac{dx}{\sin x + \tan x}$$



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$$39. \int \frac{x^2 \cos x}{(1 + \sin x)^2} dx$$



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



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$$41. \int \frac{dx}{\sqrt{2x - x^2}}$$



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

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43. समाकलन करें $\int \frac{x}{\sqrt{(2x+1)(2x-3)}} dx$

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



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



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



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47. Integrate the following: $\int \frac{\sin 2x}{\sqrt{1+\cos^2 x}} dx$



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48. Integrate the following

$$\int \sqrt{x + \sqrt{x^2 + a^2}} dx$$



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49. Evaluate: $\int \left(\frac{1-x}{1+x} \right) \cdot \frac{dx}{x}$



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



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51. Evaluate: $\int \frac{dx}{(1+x)\sqrt{1-x}}, |x| < 1$



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



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



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



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



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56. Evaluate $\int \frac{dx}{\sqrt{1 + e^x + e^{2x}}}$



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



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



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



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



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



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62. Evaluate $\int(\sqrt{\tan x} + \sqrt{\cot x}) dx$



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63. Evaluate $\int\sqrt{\cot x} dx$.



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



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



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66. $\int \sqrt{1 + \cos ecx} dx$



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67. $\int \sqrt{\sec x - 1} dx$ equal to



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68. Evaluate the following: $\int \sec \theta d\theta$



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



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70. $\int \sqrt{\frac{\sin(x - \alpha)}{\sin(x + \alpha)}} dx$





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$$71. \int \frac{dx}{\sqrt{13 + 5 \cos x - 12 \sin x}}$$



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72. Evaluate the following:

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



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73. v22



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



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75. In each of the following, fill in the blank so that the resulting sentence becomes true.

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



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76. In each of the following, fill in the blank so that the resulting sentence becomes true.

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



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



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



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79. $\int \frac{1}{\tan x + \cot x} dx =$



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80. Evaluate the following: $\int \frac{\sin x + \sin 3x}{\sqrt{1 + \sin^2 x}} dx$



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



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82. $\int \frac{\sqrt{\tan x}}{\sin 2x} dx =$



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83. Evaluate the following: $\int \frac{\sec^3 \theta d\theta}{2 - \sec^2 \theta}$



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



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85. $\int \frac{x^3 - x}{1 + x^6} dx$ is equal to



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