



MATHS

BOOKS - RS AGGARWAL MATHS (HINGLISH)

SOME SPECIAL INTEGRALS

Solved Examples

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

(ii) $\int \frac{dx}{(32 - 2x^2)}$

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



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

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



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

(ii) $\int \frac{x}{(x^4 - 9)} dx$

(iii) $\int \frac{x^2}{(x^2 - 9)} dx$



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4. Evaluate $\int \frac{dx}{(4 + 25x^2)}$.



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



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



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7. Evaluate : $\int \frac{1}{2 + \sin^2 x} \cdot dx$



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8. Evaluate $\int \frac{dx}{(x^2 + 6x + 13)}$.



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9. $\int \frac{1}{x^2 + 8x + 20} dx$



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10. Evaluate $\int \frac{dx}{(9x^2 - 12x + 8)}$.



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



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



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13. $\int \frac{1}{3x^2 + 13x - 10} dx$



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



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15. Evaluate $\int \frac{dx}{(5 - 8x - x^2)}$.



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16. $\int \frac{dx}{(1 - 6x - 9x^2)}$



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



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18. Evaluate: $\int \frac{e^x}{e^{2x} + 6e^x + 5} dx$



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



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



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



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



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



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

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



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25. $\int \frac{dx}{(4 \sin^2 x + 5 \cos^2 x)} = ?$



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26. Evaluate: $\int \frac{1}{1 + 3 \sin^2 x + 8 \cos^2 x} dx$



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27. Evaluate: $\int \frac{\sin x}{\sin 3x} dx$.



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



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29. Evaluate $\int \frac{dx}{(2 + \cos x)}$.



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

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

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





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



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



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





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



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37. Evaluate: $\int \sqrt{\tan \theta} d\theta$



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38. Evaluate: (i) $\int \frac{1}{\sqrt{9 - 25x^2}} dx$ (ii)

$\int \frac{1}{\sqrt{16x^2 + 25}} dx$



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39. $\int \frac{dx}{\sqrt{15 - 8x^2}}$



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



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

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

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43. Evaluate: $\int \frac{x^2}{\sqrt{1 - x^6}} dx$



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44. Evaluate : (i) $\int \frac{\sin x}{\sqrt{4 \cos^2 x - 1}} dx$

(ii) $\int \frac{\sec^2 x}{\sqrt{\tan^2 x - 4}} dx$



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45. Evaluate: $\int \frac{x^2}{x^6 - a^6} dx$



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46. Evaluate: (i) $\int \frac{\sec^2 x}{\sqrt{16 + \tan^2 x}} dx$ (ii)

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



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



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48. Evaluate $\int \frac{dx}{\sqrt{x^2 - 3x + 2}}$.



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



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50. Evaluate: (i) $\int \frac{e^x}{\sqrt{5 - 4e^x - e^{2x}}} dx$ (ii)

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



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



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52. Evaluate $\int \frac{dx}{\sqrt{2 - 4x + x^2}}$.



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53. Evaluate $\int \frac{dx}{\sqrt{3x^2 + 6x + 12}} dx$.



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54. Evaluate: $\int \frac{1}{\sqrt{8 + 3x - x^2}} dx$



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



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



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

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

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

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60. Evaluate : (i) $\int \sqrt{9 - x^2} dx$

(ii) $\int \sqrt{1 - 4x^2} dx$

(iii) $\int \sqrt{16 - 9x^2} dx$



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61. Evaluate : (i) $\int \sqrt{x^2 - 16} dx$

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

(iii) $\int \sqrt{17x^2 - 11} dx$



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62. Evaluate: $\int \sqrt{16x^2 + 25} dx$



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63. $\int \frac{\sqrt{16 + (\log x)^2}}{x} dx = ?$



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



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65. $\int e^x \sqrt{e^{2x} + 4} dx = ?$



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



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67. Evaluate $\int \sqrt{x^2 + 3x} dx$.



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68. Evaluate: $\int \sqrt{2x^2 + 3x + 4} dx$



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



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70. Evaluate: $\int (x + 3) \sqrt{3 - 4x - x^2} dx$



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



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72. Evaluate $\int x \sqrt{x + x^2} dx$.



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Exercise 14 A

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



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2. $\int \frac{dx}{(25 - 4x^2)}$



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3. Write the value of $\int \frac{dx}{x^2 + 16}$



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



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5.
$$\int \frac{dx}{(50 + 2x^2)}$$



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6.
$$\int \frac{dx}{(16x^2 - 25)}$$



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



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$$8. \int \frac{x^2}{9 + 4x^2} dx$$



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$$9. \int \frac{e^x}{(e^{2x} + 1)} dx = ?$$



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



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11.
$$\int \frac{\cos x}{(1 + \sin^2 x)} dx$$



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12. Evaluate:
$$\int \frac{3x^5}{1 + x^{12}} dx$$



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13.
$$\int \frac{2x^3}{(4 + x^8)} dx = ?$$



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



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$$15. \int \frac{x}{(1 - x^4)} dx = ?$$



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$$16. \int \frac{x^2}{(a^6 - x^6)} dx = ?$$



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$$17. \int \frac{dx}{(x^2 + 4x + 8)}$$



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$$18. \int \frac{dx}{(4x^2 - 4x + 3)}$$



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



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



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$$21. \int \frac{dx}{(3 - 2x - x^2)} = ?$$



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



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



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



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25. $\int \frac{x^2}{(x^2 + 6x - 3)} dx$



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



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$$27. \text{ Evaluate: } \int \frac{1 - 3x}{3x^2 + 4x + 2} dx$$



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$$28. \int \frac{2x}{2 + x - x^2} dx$$



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



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$$30. \int \frac{dx}{(2 + \sin^2 x)}$$



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$$31. \int \frac{1}{a^2 \cos^2 x + b^2 \sin^2 x} dx$$



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$$32. \int \frac{dx}{(\cos^2 x - 3 \sin^2 x)} = ?$$



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$$33. \int \frac{dx}{(\sin^2 x - 4 \cos^2 x)} = ?$$



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



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$$35. \int \frac{\sin 2x}{\sin^4 x + \cos^4 x} dx$$



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$$36. \int \frac{2 \sin 2\phi - \cos \phi}{6 - \cos^2 \phi - 4 \sin \phi} d\phi$$



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$$37. \int \frac{dx}{(\sin x - 2 \cos x)(2 \sin x + \cos x)}$$



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$$38. \int \frac{(1 - x^2)}{(1 + x^4)} dx$$



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$$39. \int \frac{x^2 + 1}{x^4 + x^2 + 1} dx$$



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40.
$$\int \frac{dx}{(\sin^4 x + \cos^4 x)}$$



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Exercise 14 B

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



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



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$$3. \int \frac{dx}{\sqrt{15 - 8x^2}}$$



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



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



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6. $\frac{dx}{\sqrt{9x^2 - 7}}$



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



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



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$$9. \int \frac{dx}{\sqrt{9x^2 + 7}}$$



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$$10. \int \frac{x}{\sqrt{9 - x^4}} dx$$



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$$11. \int \frac{3x^2}{\sqrt{9 - 16x^6}} dx$$



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12. Examples: $\int \frac{\sec^2 x}{\sqrt{16 + \tan^2 x}} dx$



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



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$$14. \int \frac{\cos x}{\sqrt{9 \sin^2 x - 1}} dx$$



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



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$$16. \int \frac{2e^x}{\sqrt{4 - e^{2x}}} dx$$



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$$17. \int \frac{dx}{\sqrt{1 - e^x}}$$



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$$18. \int \sqrt{\frac{a - x}{a + x}} dx$$



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$$19. \int \frac{dx}{\sqrt{x^2 + 6x + 5}} = ?$$



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



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



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$$22. \int \frac{dx}{\sqrt{x^2 - 6x + 10}}$$



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23. $\int \frac{dx}{\sqrt{2 + 2x - x^2}} = ?$



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



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25. Evaluate: $\int \frac{1}{\sqrt{16 - 6x - x^2}} dx$



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26. Evaluate: $\int \frac{1}{\sqrt{7 - 6x - x^2}} dx$



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27. $\int \frac{dx}{\sqrt{x - x^2}}$ is equal to



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28. $\int \frac{dx}{\sqrt{8 + 2x - x^2}}$



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$$29. \int \frac{dx}{\sqrt{x^2 - 3x + 2}}$$

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$$30. \int \frac{dx}{\sqrt{2x^2 + 3x - 2}}$$

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$$31. \int \frac{dx}{\sqrt{2x^2 + 4x + 6}}$$





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$$32. \int \frac{dx}{\sqrt{1 + 2x - 3x^2}}$$



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$$33. \int \frac{dx}{\sqrt{x}\sqrt{5-x}}$$



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$$34. \int \frac{dx}{\sqrt{3 + 4x - 2x^2}}$$



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$$35. \int \frac{x^2}{\sqrt{x^6 + 2x^3 + 3}} dx$$



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$$36. \int \frac{2x + 3}{\sqrt{x^2 + x + 1}} dx$$



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$$37. \text{ Evaluate: } \int \frac{5x + 3}{\sqrt{x^2 + 4x + 10}} dx$$



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$$38. \int \frac{(4x + 3)}{\sqrt{2x^2 + 2x - 3}}$$



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$$39. \int \frac{(3 - 2x)}{\sqrt{2 + x - x^2}} dx$$



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

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

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42. Evaluate: $\int \frac{6x + 5}{\sqrt{6 + x - 2x^2}} dx$

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



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



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Exercise 14 C

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



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



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



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



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



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



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



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$$8. \int \cos x \sqrt{9 - \sin^2 x} + dx = ?$$



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



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$$10. \int \sqrt{x^2 + 6x - 4} dx$$



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



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



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



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



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



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



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



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



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



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



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



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



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



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24. $\int (6x + 5) \sqrt{6 + x - 2x^2} dx$



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



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26. Evaluate: $\int (x - 3) \sqrt{x^2 + 3x - 18} dx$



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