



MATHS

BOOKS - OSWAAL PUBLICATION

MATHS (KANNADA ENGLISH)

INTEGRALS

Indefinite Integrals Very Short Answer Type
Questions

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



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2. Evaluate : $\int \operatorname{cosec} x (\operatorname{cosec} x - \cot x) dx$.



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3. Write the integral of $\frac{1}{x\sqrt{x^2 - 1}}$, $x > 1$
with respect to x .



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



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5. Evaluate : $\int\sin x(2 + 5x)dx$.



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6. Evaluate : $\int\tan^2 2x. dx$.



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7. Find the antiderivative of $\left(1 - \frac{1}{x^2}\right)$ with respect to x .



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8. Evaluate : $\int(\sin x + \cos x)dx$.



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9. Write the ant derivative of e^{2x} with respect to x .



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10. Integrate : $(ax + b)^3$.



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



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



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13. Find : $\int \frac{\sin^2 x - \cos^2 x}{\sin^2 x \cos^2 x} dx$:



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14. $\int \frac{\sin^6 x}{\cos^8 x} dx =$



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15. Write the anti derivative of $\left(3\sqrt{x} + \frac{1}{\sqrt{x}} \right)$

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

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17. Write the value of : $\int \frac{x + \cos 6x}{3x^2 + \sin 6x} dx.$

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18. Evaluate : $\int(1 - x)\sqrt{x}dx$.



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19.

Given

$\int e^x (\tan x + 1)\sec x dx = e^x f(x) + c$ write

$f(x)$ satisfying the above.



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20. If $\int \left(\frac{x-1}{x^2} \right) e^x dx = f(x)e^x + c$, then write the value of $f(x)$.



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



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



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



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



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



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



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27. Evaluate : $\int \frac{(\log x)^2}{x} dx$.



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





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29. Evaluate : $\int 5^x dx$.



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



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



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32. Find : $\int \frac{x^3 - 1}{x^2} dx$



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



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34. Evaluate : $\int 2^x dx.$



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



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36. $\int \sec^2(7 - 4x) dx.$



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Indefinite Integrals Short Answer Type Questions

1. Evaluate: $\int \sin^3 x dx$



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



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



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4. Evaluate : $\int \log x dx$



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5. Evaluate : $\int \log(\sin x) \cdot (\cot x) dx.$



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6. $\int e^x \sec x (1 + \tan x) dx.$



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



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



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9. Evaluate : $\int \frac{dx}{x^2 - 6x + 13}$



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



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



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12. Evaluate: $\int \frac{dx}{x - \sqrt{x}}.$



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



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



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15. Integrate $\sin x \cdot \sin(\cos x)$ with respect to x .



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16. Evaluate : $\int e^x \left[\frac{1 + \sin x \cos x}{\cos^2 x} \right] dx.$



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17. Evaluate : $\int \tan^8 x \sec^4 x dx.$



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18. Verify the following using the concept of integration as an antiderivative.

$$\int \frac{x^3 dx}{x+1} = x - \frac{x^2}{2} + \frac{x^3}{3} - \log|x+1| + c$$



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Indefinite Integrals Short Answer Type Questions

ii

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



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2. Find the antiderivative of $f(x)$ given by

$$f'(x) = 4x^3 - \frac{3}{x^4} \text{ such that } f(2) = 0.$$



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



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4. Evaluate : $\int \sin(ax + b)\cos(ax + b)dx.$



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

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

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7. Integrate : $\int \frac{\sin x}{\sin(a + x)}$ with respect to x .

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8. Evaluate : $\int e^x \sin x dx$.



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



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



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

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

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

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



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15. Evaluate : $\int \sin 3x \cos 4x dx$



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16. Evaluate : $\int \frac{dx}{(x - \alpha)(\beta - x)} \beta > \alpha$





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17. Integrate $x^2 e^x$ with respect to x .



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18. $\int \sin^4 x dx =$



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





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



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21. Find : $\int \frac{x^3}{x^4 + 3x^2 + 2} dx.$



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22. Evaluate $\int \frac{x \cos^{-1} x}{\sqrt{1 - x^2}} dx$



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23. Evaluate : $\int \frac{\sin^6 x + \cos^6 x}{\sin^2 x \cdot \cos^2 x} dx.$



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



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



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



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27. Evaluate : $\int \frac{(3 \sin x - 2) \cos x}{5 - \cos^2 x - 4 \sin x} dx.$



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28. Evaluate : $\int e^{2x} \left[\frac{1 - \sin 2x}{1 - \cos 2x} \right] dx.$



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



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



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31. Evaluate : $\int \frac{\sqrt{1 - \sin x}}{1 + \cos x} e^{-x/2} dx.$



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



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



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



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35. Evaluate : $\int \frac{dx}{x(x^5 + 3)}$



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36. Evaluate the following

i) $\int \frac{\sin x + \cos x}{9 + 16 \sin 2x} dx,$ ii) $\int \left(\frac{\cos x - \sin x}{\sqrt{8 - \sin 2x}} \right) dx$



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

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

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



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40. Evaluate $\int \frac{5x}{(x+1)(x^2+9)} dx$

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

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



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



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44. Evaluate : $\int \sin x \sin 2x \sin 3x dx.$



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



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



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



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



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49. $\int \frac{x^2 - 4}{x^4 + 16} dx$



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



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



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



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



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55. Evaluate: $\int \frac{\sin x + \cos x}{\sqrt{\sin x \cos x}} dx.$



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



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57. Evaluate: $\int e^{2x} \sin x dx$



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58. Evaluate :

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



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



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

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61. Evaluate: $\int e^x \left(\frac{\sin 4x - 4}{1 - \cos 4x} \right) dx$

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

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



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



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65. Evaluate :

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



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66. Evaluate :

$$\int \sqrt{(x - 5)(x - 7)} dx$$



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67. Evaluate :

$$\int \sqrt{14x - 20 - 2x^2} dx$$



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68. Evaluate :

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



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Indefinite Integrals Long Answer Type Questions ii

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



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



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3. $\int \frac{dx}{5 - 8x - x^2}$



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



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



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6. Find the integral of $\frac{1}{\sqrt{x^2 - a^2}}$ with respect to x and hence evaluate $\int \frac{dx}{\sqrt{x^2 + 6x - 7}}$.



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7. Find the integral of $\frac{1}{\sqrt{a^2 - x^2}}$ with respect to x and hence find $\int \frac{1}{\sqrt{7 - 6x - x^2}} dx$



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8. find $\int \frac{1}{x^2 - a^2} dx$ and hence evaluate $\int \frac{1}{3x^2 + 13x - 10} dx$



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9. Find the integral of $\sqrt{x^2 + a^2}$ with respect to x and evaluate $\int \sqrt{4x^2 + 9} dx$.



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10. Find the integral of $\frac{1}{\sqrt{x^2 + a^2}}$ with respect to x and hence evaluate $\int \frac{1}{\sqrt{x^2 + 7}} dx$

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

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

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



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



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





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16.

Find

:

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



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17. Find : $\int \frac{1}{\sin^4 x + \cos^4 x} dx.$



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18. Evaluate : $\int \sqrt{\cot x} + \sqrt{\tan x} dx$.



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



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



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

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

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23. Evaluate: $\int \frac{1}{\sin x(5 - 4 \cos x)} dx.$

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



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25. Evaluate : $\int (5x - 1) \sqrt{6 + 5x - 2x^2} dx.$



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Definite Integrals Short Type Answer Type
Questions I

1. Evaluate : $\int_2^3 \frac{x}{x^2 + 1} dx$



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



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



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



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



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6. Evaluate the following integral:

$$\int_0^{\pi/2} 2s \in x \cos x \tan^{-1}(\sin x) dx$$



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



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Definite Integrals Very Type Answer Type
Questions li

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



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$$2. \int_2^8 \frac{\sqrt{10-x}}{\sqrt{x} + \sqrt{10-x}} dx$$



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Definite Integrals Long Type Answer Type Questions iii

1. Prove that $\int_0^{2a} f(x) dx = 2 \int_0^a f(x) dx$

when $f(2a-x) = f(x)$ and hence evaluate

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



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2.

Prove

that

$$\int_{-a}^a dx = \begin{cases} 2\int_0^a f(x)dx & \text{if } f(x) \text{ is even} \\ 0 & \text{if } f(x) \text{ is odd} \end{cases}$$

and hence evaluate

(a) $\int_{-1}^1 \sin^5 x \cos^4 x dx.$



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



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



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5. Prove that

$$\int_a^b f(x) dx = \int_a^b f(a+b-x) dx \text{ and hence}$$

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



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6. Prove that $\int_0^a f(x)dx = \int_0^a f(a-x)dx$
and hence evaluate $\int_0^{\frac{\pi}{4}} \log(1 + \tan x)dx$.



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7. Evaluate the following integrals: (1-35)

$$\int_{-1}^1 |x \cos \pi x| dx$$



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



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



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10. Show that :

$$\int_0^{\frac{\pi}{2}} \frac{\sin^2 x}{\sin x + \cos x} dx = \frac{1}{\sqrt{2}} \log(\sqrt{2} + 1)$$



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11. Evaluate the definite integrals

$$\int_0^{\frac{\pi}{6}} \frac{\pi \sin x + \cos x}{3 \sqrt{\sin 2x}} dx$$



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12. Evaluate : $\int_0^{\pi} \frac{4x \sin x}{1 + \cos^2 x} dx.$



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



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14.
$$\int_0^{\frac{\pi}{2}} \frac{\sin 2\theta}{\sin^4 \theta + \cos^4 \theta} d\theta$$



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15. Evaluate:
$$\int_0^4 (|x| + |x - 2| + |x - 4|) dx$$



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16.
$$\int_2^5 (|x - 2| + |x - 3| + |x - 5|) dx$$





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17. Evaluate: $\int_0^{2\pi} \frac{1}{1 + e^{\sin x}} dx$



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



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19. Evaluate: $\int_{-1}^2 |x^3 - x| dx$



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20. Evaluate: $\int_{\pi/4}^{\pi/2} \cos 2x \log \sin x dx$



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



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



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23. Evaluate : $\int_0^{\frac{3}{2}} |x \cos \pi x| dx$



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24. Using properties of definite integrals,

evaluate $\int_0^{\pi} \frac{x dx}{4 - \cos^2 x}$.



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25. Evaluate the following:

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



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



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



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



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



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



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31. Evaluate : $\int_{\frac{\pi}{6}}^{\frac{\pi}{3}} \frac{dx}{1 + \sqrt{\cot x}}$



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32. Evaluate the following :

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



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33. Evaluate: $\int_0^1 x (\tan^{-1} x)^2 dx$



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34. Evaluate : $\int_{\frac{\pi}{4}}^{\frac{\pi}{2}} \cos 2x \log(\sin x) dx.$



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



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



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



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38. Evaluate : $\int_1^2 (x^2 + x + 2) dx$ as the limit of sums.

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39. $\int_0^1 \sin^{-1} \left(x\sqrt{1-x} - \sqrt{x}\sqrt{1-x^2} \right) dx$

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40. Evaluate: $\int_{-1}^{3/2} |x \sin \pi x| dx$

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