



MATHS

BOOKS - MODERN PUBLICATION

INTEGRATION

Problem

1. What is the value of

$$\frac{dy}{dx} \int_{250}^{300} (x^4 + 5x^3)^2 dx ?$$



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2. write down the integral of $\int e^{x^2} 2x dx$.



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3. What is the integral of $\int \log e^x dx$?



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4. Write the value of $\int e^x e^{e^x} e^{e^{e^x}} dx$.



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5. What is the value of $\int_{-2}^2 |x| dx$?



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6. $\int_{-1}^1 |1 - x| dx =$ _____



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7. If $\int x^3 e^{cx^4} dx = \frac{1}{20} e^{cx^4}$ then $C =$ _____





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8. $\int \frac{d}{dx}(f(x))dx = \frac{d}{dx} \int f(x)dx$ (True/false)



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9. $\int_a^b f(x)dx = 1 \Rightarrow \int_b^a kf(t)dt = \underline{\hspace{2cm}}$



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10. $\frac{d}{dt} \left[\int_a^t f(x)dx \right] = \underline{\hspace{2cm}}$



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11. $\int_{-1}^1 f(x) dx = K$ and f is an even function,
then $\int_{-1}^1 f(x) dx = \text{-----}$



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12. If $\int_0^1 f(x) dx = 4$, $\int_0^2 f(t) dt = 2$ and
 $\int_4^2 f(u) du = 1$ then $\int_1^4 f(x) dx = _ _$



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13. $\int_0^x \cos^{101} x dx = _ _$



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14. Let f satisfies all the conditions of Rolle's theorem in $[1,6]$ then $\int_1^6 f'(x) dx = _ _$



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15. $\int_0^a x(1-x) dx = 0$ implies $a = _ _$



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16. $\int_0^{\frac{\pi}{4}} \tan^2 x dx$



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17. Integrate $\int \log x dx$



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18. What is the value of $\int \{f'(x) - f(x)\}e^x dx$

?



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19. $\int_0^{\frac{\pi}{2}} \ln(\tan x + \cot x) dx$



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20. what is the value of $\int_0^1 x(1-x)^{99} dx$?



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21. $\int \frac{x dx}{e^{x^2} + e^{-x^2}} = \text{-----}$



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22. What is the value of $\int \frac{1 + \frac{1}{x^2}}{x - \frac{1}{x} + 4} dx$



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23. The smallest interval $[a,b]$ such that

$\int_0^1 \frac{dx}{\sqrt{1+x^4}}$ in $[a,b]$ is given by _____



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24. $f(x) = \int_0^x t \sin t dt$ then $f'(x) = _ _$



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25. What is the value of the integral

$$\int 2^x (f'(x) + f(x) \ln 2) = 2^x f(x) + C$$



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26. what is the value of integral $\int_a^b \frac{|x|}{x} dx$.



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27. What is the value of $\int x^x (1 + \ln x) dx$?



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28. Evaluate : $\int_0^{\frac{\pi}{2}} \ln(\cot x)$



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29. Evaluate : $\int_{-3}^4 |x| dx$



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30. Evaluate : $\int_0^{\frac{\pi}{2}} (\cos x - \sin x) dx$.



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



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



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33. Evaluate : $\int \frac{d\theta}{4 \cos^2 \theta + 9 \sin^2 \theta}$



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34. Evaluate the following integrals

$$\int \frac{dx}{7 - x^2 + 6x}$$



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35. Integrate : $\int \frac{3x dx}{x^2 - x - 2}$



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36. Evaluate : $\int \sqrt{1 - \sin x} dx$ for $x \in \left(\frac{\pi}{2}, \pi\right)$



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37. Evaluate $\int (dx)/(3e^x - 1)$



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



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



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40. Evaluate : $\int e^x ((1 - \sin x)(1 - \cos x)) dx$



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



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42. Integrate : $\int \frac{dx}{\sin^2 x - 3 \cos^2 x}$



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



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



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



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



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47. Evaluate $\int \frac{1}{2 \sin x + 3 \cos x} dx.$



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48.
$$\int_{\pi/6}^{\pi/3} \frac{dx}{1 + \sqrt{\cot x}}$$



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49. Evaluate :
$$\int \sin(\log x) dx$$



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50. Intergrate the following:

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



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51. Integrate the following $\int \frac{x - 2}{\sqrt{3x^2 - 8}} dx$



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52. $\int \ln(x^2 + x + 2) dx$



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53. Evaluate : $\int e^x \cos^2 x dx$



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54. Integrate: $\int \frac{\cos x + \sin 2x}{\sin x} dx$



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55. Evaluate the following integrals

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



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