



GRADE 12TH MATHS
CHAPTER 7

Integration

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1. $\int x^2 e^{x^3} dx$ equals
 (a) $\frac{1}{3} e^{x^3} + C$ (b) $\frac{1}{3} e^{x^4} + C$ (c) $\frac{1}{2} e^{x^3} + C$ (d) $\frac{1}{2} e^{x^2} + C$
2. Find $\int \frac{x}{x^2 + 3x + 2} dx$.
3. Find the value of $\int_1^4 |x - 5| dx$.
4. $\int \frac{e^x(1+x)}{\cos^2(xe^x)} dx$ is equal to
 (a) $\tan(xe^x) + c$ (b) $\cot(xe^x) + c$ (c) $\cot(e^x) + c$ (d) $\tan[e^x(1+x)] + c$
5. Evaluate: $\int_{-2}^2 |x| dx$
6. Find: $\int \frac{dx}{3 + 4x^2}$
7. Evaluate: $\int_{-1}^5 (|x| + |x+1| + |x-5|) dx$
8. $\int \frac{1}{x \log x} dx$ is equal to
 (a) $\frac{(\log x)^2}{2} + c$ (b) $\log|\log x| + c$ (c) $\log|x \log x| + c$ (d) $\frac{1}{\log x} + c$
9. Evaluate: $\int_{-1}^{3/2} |x \sin \pi x| dx$

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10. $\int x^2 e^{x^3} dx$ equals
- (a) $\frac{1}{3} e^{x^3} + C$
 (b) $\frac{1}{3} e^{x^4} + C$
 (c) $\frac{1}{2} e^{x^3} + C$
 (d) $\frac{1}{2} e^{x^2} + C$

11. Evaluate $\int_1^2 \left[\frac{1}{x} - \frac{1}{2x^2} \right] e^{2x} dx$.

12. Find the value of $\int_0^1 x(1-x)^n dx$.

13.

$\int 4^x 3^x dx$ equals

- (a) $\frac{12^x}{\log 12} + C$
 (b) $\frac{4^x}{\log 4} + C$
 (c) $\left(\frac{4^x \cdot 3^x}{\log 4 \cdot \log 3} \right) + C$
 (d) $\frac{3^x}{\log 3} + C$

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

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

16. Find $\int \frac{x+1}{(x+2)(x+3)} dx$.

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17. Find the value of $\int_0^1 \tan^{-1} \left(\frac{1-2x}{1+x-x^2} \right) dx$.

Find :

18. $\int \frac{\sin x - \cos x}{\sqrt{1 + \sin 2x}} dx, 0 < x < \pi/2$

Find :

19. $\int \frac{\sin(x-a)}{\sin(x+a)} dx$

Find :

20. $\int (\log x)^2 dx$

Find :

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

Prove that

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

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

23. Find : $\int \frac{\sec^2 x}{\sqrt{\tan^2 x + 4}} dx$.

24. Find : $\int \sqrt{1 - \sin 2x} dx, \frac{\pi}{4} < x < \frac{\pi}{2}$

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

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26. Find: $\int \frac{3x+5}{x^2+3x-18} dx$.

27. Prove that $\int_0^a f(x) dx = \int_0^a f(a-x) dx$, hence evaluate $\int_0^\pi \frac{x \sin x}{1+\cos^2 x} dx$.

28. Find: $\int \frac{\tan^2 x \sec^2 x}{1-\tan^6 x} dx$.

29. Find: $\int \sin x \cdot \log \cos x dx$

30. Find $\int_{-\pi}^\pi (1-x^2) \sin x \cos^2 x dx$

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

32. Find:
 $\int x \cdot \tan^{-1} x dx$

33. Find:
 $\int \frac{dx}{\sqrt{5-4x-2x^2}}$

34. Find:
 $\int_{-\frac{\pi}{4}}^0 \frac{1+\tan x}{1-\tan x} dx$

35. Integrate the function $\frac{\cos(x+a)}{\sin(x+b)}$ w.r.t. x .

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36. Find : $\int \frac{3 - 5 \sin x}{\cos^2 x} dx.$

37. Find : $\int \frac{4}{(x-2)(x^2+4)} dx$

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

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

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

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

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

43. Evaluate : $\int_2^3 3^x dx.$

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

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

46. Evaluate : $\int_0^{3/2} |x \sin \pi x| dx$

47. Find : $\int \frac{(3 \sin x - 2) \cos x}{13 - \cos^2 x - 7 \sin x} dx$

48. Find the value of $\int \frac{\sqrt{\tan x}}{\sin x \cos x} dx$.

49. Find : $\int \frac{\sqrt{\cot x}}{\cos x \sin x} dx$.

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