

Chapter- 7

INTEGRALS

1. Evaluate: $\int_0^{\frac{\pi}{2}} \frac{\sin^2 x}{\sin x + \cos x} dx$
2. Evaluate: $\int_0^1 \cot^{-1}(1 - x + x^2) dx$
3. Find $\int \frac{dx}{x^2 + 4x + 8}$
4. Evaluate: $\int \frac{\cos 2x - \cos 2\alpha}{\cos x - \cos \alpha} dx$
5. Find: $\int \frac{dx}{5 - 8x - x^2}$
6. Find: $\int e^x \frac{\sqrt{1 + \sin 2x}}{1 + \cos 2x} dx$
7. Evaluate: $\int \cos^3 x \sin^4 x dx$
8. Evaluate: $\int_0^a \frac{\sqrt{x}}{\sqrt{x} + \sqrt{a-x}} dx$
9. Evaluate as a limit of sum: $\int_0^2 (x - 3) dx$
10. Evaluate: $\int x e^x dx$
11. Evaluate: $\int \frac{x^2}{x^2 + 4} dx$
12. Evaluate: $\int \frac{\sqrt{\tan x}}{\sin x \cos x} dx$
13. Evaluate: $\int_0^{\frac{3\pi}{2}} |\sin x| dx$
14. Evaluate: $\int \frac{\log x}{x^2} dx$
15. Find $\int \left[\log(\log x) + \frac{1}{(\log x)^2} \right] dx$
16. Find: $\int \frac{1 - \sin x}{\sin x(1 + \sin x)} dx$
17. Find $\int \frac{2x}{(x^2 + 1)(x^2 + 2)^2} dx$
18. Find: $\int \frac{2x}{(x^2 + 1)(x^4 + 4)} dx$
19. Evaluate: $\int_0^{\pi} \frac{x \sin x}{1 + \cos^2 x} dx$
20. Evaluate: $\int_0^{\frac{3}{2}} |x \sin \pi x| dx$
21. Evaluate: $\int \frac{x^2}{x^4 + x^2 + 1} dx$
22. Evaluate: $\int_0^1 \frac{x}{1 + \sqrt{x}} dx$
23. Evaluate: $\int_0^1 \frac{\log(1+x)}{1+x^2} dx$
24. Find: $\int \frac{\cos \theta}{(4 + \sin^2 \theta)(5 - 4 \cos^2 \theta)} d\theta$
25. Evaluate: $\int_0^{\pi} \frac{x \tan x}{\sec x + \tan x} dx$

26. Evaluate: $\int_1^4 \{|x - 1| + |x - 2| + |x - 4|\} dx$

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

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

29. Find: $\int \frac{\sec x}{1 + \operatorname{cosec} x} dx$

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

31. Evaluate: $\int x^2 \cot^{-1} x dx$

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

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

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

35. Evaluate: $\int \sin x \sqrt{1 + \cos 2x} dx$

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

37. Evaluate $\int_{-2}^3 (3x^2 - 2x + 4) dx$ as the limit of a sum.

38. Evaluate: $\int (3x + 5)\sqrt{2x^2 + 3x + 7} dx$

39. Evaluate: $\int \frac{\sqrt{x^2 + 1}[\log(x^2 + 1) - 2\log x]}{x^4} dx$

40. Evaluate: $\int_{\frac{\pi}{2}}^{\pi} e^x \left(\frac{1 - \sin x}{1 - \cos x} \right) dx$

41. Evaluate: $\int_0^{\frac{\pi}{2}} \log \sin 2x dx$

42. Evaluate: $\int_0^{\frac{\pi}{2}} \log \sin x dx$

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

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

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