

TOPIC: DEFINITE INTEGRATION

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1. Evaluate $\int_1^3 (3x^2 + 1) dx$ by the method of limit of sum.

2. Evaluate $\int_0^{\pi/2} (2x^2 + 5x) dx$ as a limit of a sum.

3. Evaluate $\int_1^4 (x^2 - x) dx$ as a limit of a sum.

4. Ev Evaluate $\int_0^2 (x^2 - x) dx$ as a limit of a sum.

5. Evaluate $\int_1^3 (2x^2 + 3) dx$ as a limit of a sum.

6. Evaluate $\int_1^2 (x^2 + 5x) dx$ as a limit of a sum.

7. Evaluate $\int_1^3 (3x^2 + 2x) dx$ as a limit of a sum.

8. Evaluate $\int_2^5 (3x^2 - 5) dx$ as a limit of a sum.

9. Evaluate $\int_0^2 (3x^2 - 2) dx$ as a limit of a sum.

10. Evaluate $\int_1^3 (x^2 + x) dx$ as a limit of a sum.

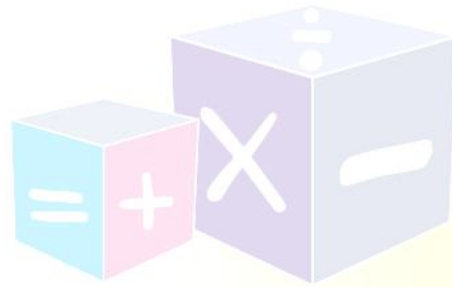
11. Evaluate $\int_1^3 (x^2 + 5x) dx$ as a limit of a sum.

12. Evaluate $\int_0^{\pi/4} \tan x dx$

13. Evaluate $\int_0^1 x e^{x^2} . dx$

14. Evaluate $\int_0^{\pi/4} \sin 2x dx$

15. Evaluate $\int_0^1 \frac{1}{\sqrt{1-x^2}} dx$



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16. If $\int_0^a \frac{1}{4+x^2} dx = \frac{\pi}{8}$, then find the value of $f'(x)$.

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

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

19. Evaluate $\int_{-\pi/4}^{\pi/4} \sin^3 x dx$

20. Evaluate $\int_0^{1/\sqrt{2}} \frac{1}{\sqrt{1-x^2}} dx$

21. If $\int_0^1 (3x^2 + 2x + k) dx = 0$, then find the value of k .

22. Evaluate $\int_2^5 [|x-2| + |x-3| + |x-5|] dx$

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

24. Evaluate $\int_1^3 [|x-1| + |x-2| + |x-3|] dx$

25. Evaluate $\int_0^1 \frac{\tan^{-1} x}{1+x^2} dx$

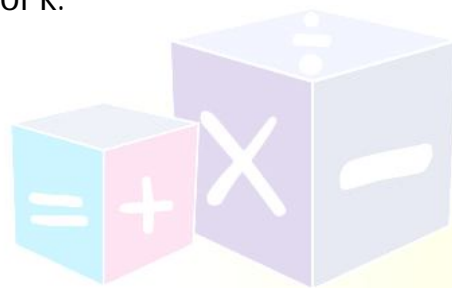
26. Evaluate $\int_0^2 \sqrt{4-x^2} dx$

27. Evaluate $\int_1^{\sqrt{3}} \frac{dx}{1+x^2}$

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

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

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



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31. Using the properties of definite integrals, evaluate $\int_0^a \frac{\sqrt{x}}{\sqrt{x} + \sqrt{a-x}} dx$

32. Evaluate $\int_0^{\pi/2} \log \sin x dx$

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

34. Evaluate $\int_{-a}^a \sqrt{\frac{a-x}{a+x}} dx$

35. Evaluate $\int_0^{\pi} \frac{e^{\cos x}}{e^{\cos x} + e^{-\cos x}} dx$

36. Evaluate $\int_0^{\pi/2} (2 \log \sin x - \log \sin 2x) dx$

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

38. Evaluate $\int_0^a \sin^{-1} \sqrt{\frac{x}{a+x}} dx$

39. If $f(x) = \int_0^x t \sin t dt$, then write the value of $f'(x)$.

40. Evaluate $\int_2^4 \frac{x}{x^2+1} dx$

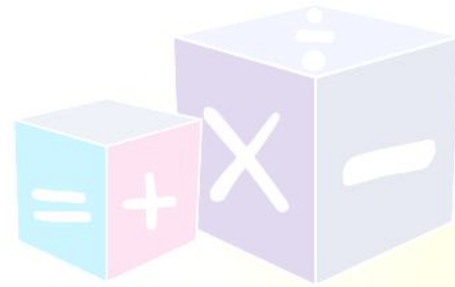
41. Evaluate $\int_0^3 \frac{dx}{9+x^2}$

42. Evaluate $\int_0^{\pi/2} e^x (\sin x - \cos x) dx$

43. Evaluate $\int_e^{e^2} \frac{dx}{x \log x}$

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

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



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

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

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

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

50. Evaluate $\int_5^{-5} |x+2| dx$

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

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

53. Evaluate $\int_2^{\pi} \frac{x \tan x}{\sec x + \tan x} dx$

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

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

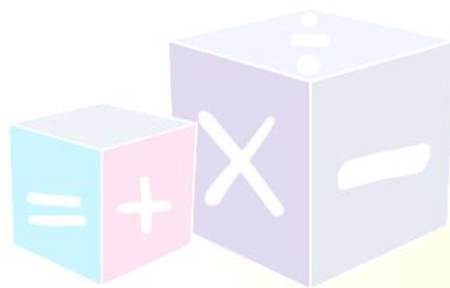
56. Evaluate $\int_0^{\pi} \frac{x \tan x}{\sec x \cdot \operatorname{cosec} x} dx$

57. Evaluate $\int_0^{\pi/2} 2 \sin x \cos x \tan^{-1}(\sin x) dx$

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

59. Evaluate $\int_0^1 \cot^{-1}(1-x+x^2) dx$

60. Evaluate $\int_1^4 (|x-1| + |x-2| + |x-4|) dx$



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61. Evaluate $\int_{\pi/6}^{\pi/3} \frac{\sin x + \cos x}{\sqrt{\sin 2x}} dx$

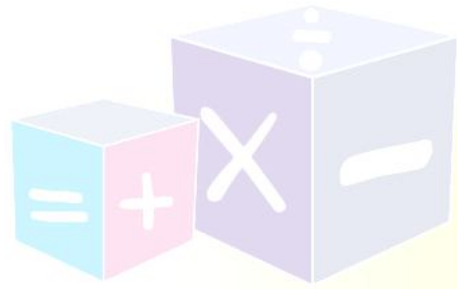
62. Evaluate $\int_0^{\pi/2} x^2 \sin x dx$

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

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

65. Evaluate $\int_0^{\pi/4} \log(1 + \tan x) dx$

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