

Gandaki University
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Bachelor of Information Technology (BIT)
BSM 101
Exercise on Integration

Integrate the following functions:

1. $\int (x + 1) dx$
2. $\int (5 - 6x) dx$
3. $\int x^{-1/3} dx$
4. $\int x^{-5/4} dx$
5. $\int (\sqrt{x} + \sqrt[3]{x}) dx$
6. $\int \left(\frac{\sqrt{x}}{2} + \frac{2}{\sqrt{x}} \right) dx$
7. $\int \left(8y - \frac{2}{y^{1/4}} \right) dy$
8. $\int \left(\frac{1}{7} - \frac{1}{y^{5/4}} \right) dy$
9. $\int x e^{x^2} dx$
10. $\int 2x e^{x^2-1} dx$
11. $\int t (t^2 + 1)^5 dt$
12. $\int 3t \sqrt{t^2 + 8} dt$
13. $\int x^2 (x^3 + 1)^{3/4} dx$
14. $\int x^5 e^{1-x^6} dx$
15. $\int \frac{2y^4}{y^5 + 1} dy$
16. $\int (3x^2 - 1) e^{x^3-x} dx$
17. $\int \frac{3x^4 + 12x^3 + 6}{x^5 + 5x^4 + 10x + 12} dx$
18. $\int \frac{10x^3 - 5x}{\sqrt{x^4 - x^2 + 6}} dx$

19. $\int \frac{3u-3}{(u^2-2u+6)^2} du$
20. $\int 3(x^5-2x)(x^6-6x^2+7)^{-2} dx$
21. $\int 7x^3 \sqrt{x^4+6} dx$
22. $\int 3x \sqrt{5-x^2} dx$
23. $\int (x^3+1)^2 (3x dx)$
24. $\int (x^2-5)^2 (2x^2 dx)$
25. $\int (3x^4-1)^2 12x dx$
26. $\int (2x^4+3)^2 (8x dx)$
27. $\int \sqrt{x^3-3x} (x^2-1) dx$
28. $\int \sqrt[3]{x^2+2x} (x+1) dx$
29. $\int \frac{3x^4 dx}{(2x^5-5)^4}$
30. $\int \frac{5x^3 dx}{(x^4-8)^3}$
31. $\int \frac{x^3-1}{(x^4-4x)^3} dx$
32. $\int \frac{3x^5-2x^3}{(x^6-x^4)^5} dx$
33. $\int \frac{x^2-4x}{\sqrt{x^3-6x^2+2}} dx$
34. $\int \frac{x^2+1}{\sqrt{x^3+3x+10}} dx$
35. If $\int f(x) dx = (7x-13)^{10} + C$, find $f(x)$.
36. $\int \frac{6u-3}{4u^2-4u+1} du$
37. $\int \frac{\ln 5x}{x} dx$
38. $\int \frac{1}{x \ln x} dx$
39. $\int \frac{e^{\sqrt{x}}}{\sqrt{x}} dx$
40. $\int \frac{e^x + e^{-x}}{e^x - e^{-x}} dx$
41. $\int e^{-x} (1 + e^{2x}) dx$
42. $\int \frac{x}{2x+1} dx$

$$43. \int \frac{t-1}{t+1} dt$$

$$44. \int \frac{t+3}{t-3} dt$$

$$45. \int \frac{x+7}{x-3} dx$$

$$46. \int x \sqrt{2x+1} dx$$

$$47. \int \frac{x}{\sqrt[3]{4-3x}} dx$$