

(MATHEMATICS)

INDEFINITE INTEGRATION

DPP-2

1. $\int \tan x dx.$
2. $\int \cot x dx.$
3. $\int \tan 3x dx$
4. $\int \cot(2x + 1) dx.$
5. $\int \frac{d\left(\frac{x}{3}\right)}{\sqrt{1-\left(\frac{x}{3}\right)^2}}.$
6. $\int \frac{dx}{\sqrt{1-25x^2}}.$
7. $\int \frac{dx}{1+9x^2}.$
8. $\int \frac{dx}{x^2-7x+10}$
9. $\int \frac{dx}{x^2+3x-10}$
10. $\int \frac{dx}{4x^2-9}$
11. $\int \frac{dx}{2-3x^2}$
12. $\int \frac{dx}{(x-1)^2+4}$
13. $\int \frac{dx}{\sqrt{1-(2x+3)^2}}.$
14. $\int \frac{dx}{\sqrt{4x-3-x^2}}$
15. $\int 2^x \cdot e^x dx$
16. $\int \frac{1+\cos^2 x}{1+\cos 2x} dx$
17. $\int \frac{1-\tan^2 x}{1+\tan^2 x} dx$
18. $\int \frac{1+\tan^2 x}{1+\cot^2 x} dx$
19. $\int \frac{e^{5\ln x}-e^{4\ln x}}{e^{3\ln x}-e^{2\ln x}} dx$
20. $\int (e^{a\ln x} + e^{x\ln a}) dx (a > 0)$
21. $\int \frac{\cos 2x}{\cos^2 x \sin^2 x} dx$
22. $\int \frac{1+2x^2}{x^2(1+x^2)} dx$
23. $\int 4\cos \frac{x}{2} \cdot \cos x \cdot \sin \frac{21}{2} x dx$
24. $\int \frac{\cos x - \sin x}{\cos x + \sin x} (2 + 2\sin 2x) dx$
25. $\int (3\sin x \cos^2 x - \sin^3 x) dx$
26. $\int \cos x^\circ dx$
27. $\int \frac{(1+x)^2}{x(1+x^2)} dx$
28. $\int \frac{x}{2x+1} dx$
29. $\int \frac{\sec 2x-1}{\sec 2x+1} dx$
30. $\int \frac{2x-1}{x-2} dx$
31. $\int \frac{e^{2x}-1}{e^x} dx$
32. $\int \frac{\sin x + \cos x}{\sqrt{1+\sin 2x}} dx (\cos x + \sin x > 0)$
33. $\int \frac{\cos 2x - \cos 2\alpha}{\cos x - \cos \alpha} dx$
34. $\int \frac{x^6-1}{x^2+1} dx$
35. $\int \frac{\sin^3 x + \cos^3 x}{\sin^2 x \cos^2 x} dx$
36. $\int \frac{x^4+x^2+1}{2(1+x^2)} dx$
37. $\int \sqrt{1-\sin 2x} dx$
38. $\int \frac{\sin^6 x + \cos^6 x}{\sin^2 x \cdot \cos^2 x} dx$
39. $\int \frac{(\sqrt{x}+1)(x^2-\sqrt{x})}{x\sqrt{x}+x+\sqrt{x}} dx$

ANSWER KEY

1. $C - \ln|\cos x|$
2. $\ln|\sin x| + C$
3. $C - \frac{1}{3}\ln|\cos 3x|$
4. $\frac{1}{2}\ln|\sin(2x + 1)| + C$
5. $\arcsin \frac{x}{3} + C$
6. $\frac{1}{5}\arcsin 5x + C$
7. $\frac{1}{3}\arctan 3x + C$
8. $\frac{1}{3}\ln \left| \frac{x-5}{x-2} \right| + C$
9. $\frac{1}{7}\ln \left| \frac{x-2}{x+5} \right| + C$
10. $\frac{1}{12}\ln \left| \frac{2x-3}{2x+3} \right| + C$
11. $\frac{1}{2\sqrt{6}}\ln \left| \frac{\sqrt{2}+x\sqrt{3}}{\sqrt{2}-x\sqrt{3}} \right| + C$
12. $\frac{1}{2}\arctan \frac{x-1}{2} + C$
13. $\frac{1}{2}\arcsin(2x + 3) + C$
14. $\arcsin(x - 2) + C$
15. $\frac{2^x \cdot e^x}{1 + \ln 2} + C$
16. $\frac{1}{2}(\tan x + x) + C$
17. $\frac{1}{2}\sin 2x + C$
18. $\tan x - x + C$
19. $\frac{x^3}{3} + C$
20. $\frac{x^{a+1}}{a+1} + \frac{a^x}{\ln a} + C$
21. $-(\cot x + \tan x) + C$
22. $-\frac{1}{x} + \tan^{-1}x + C$
23. $-\left[\frac{1}{9}\cos 9x + \frac{1}{10}\cos 10x + \frac{1}{11}\cos 11x + \frac{1}{12}\cos 12x \right] + C$
24. $\sin 2x + C$
25. $-\frac{\cos 3x}{3} + C$
26. $\frac{180}{\pi}\sin x^\circ + C$
27. $\ln x + 2\tan^{-1}x + C$
28. $\frac{1}{2}\left[x - \frac{\ln(2x+1)}{2} \right] + C$
29. $\tan x - x + C$
30. $2x + 3\ln(x - 2) + C$
31. $e^x + e^{-x} + C$
32. $x + C$
33. $2(\sin x + x\cos x) + C$
34. $\frac{x^5}{5} - \frac{x^3}{3} + x - 2\tan^{-1}x + C$
35. $\sec x - \operatorname{cosec} x + C$
36. $\frac{1}{2}\left[\frac{x^3}{3} + \tan^{-1}x \right] + C$
37. $(\sin x + \cos x)\operatorname{sgn}(\cos x - \sin x) + C$
38. $\tan x - \cot x - 3x + C$
39. $\frac{x^2}{2} - x + C$