

常用積分表

1. $\int x^n dx = \frac{1}{n+1}x^{n+1} + C, n \neq -1 \circ$
2. $\int \frac{1}{x} dx = \log |x| + C \circ$
3. $\int \sin x dx = -\cos x + C \circ$
4. $\int \cos x dx = \sin x + C \circ$
5. $\int \sec^2 x dx = \tan x + C \circ$
6. $\int \csc^2 x dx = -\cot x + C \circ$
7. $\int \sec x \tan x dx = \sec x + C \circ$
8. $\int \csc x \cot x dx = -\csc x + C \circ$
9. $\int e^x dx = e^x + C \circ$
10. $\int \frac{1}{\sqrt{a^2-x^2}} dx = \arcsin \frac{x}{|a|} + C, a \neq 0 \circ$
11. $\int \frac{1}{a^2+x^2} dx = \frac{1}{a} \arctan \frac{x}{a} + C, a \neq 0 \circ$
12. $\int \frac{1}{x\sqrt{x^2-a^2}} dx = \frac{1}{a} \operatorname{arcsec} \frac{x}{a} + C \circ$
13. $\int \frac{1}{x\sqrt{ax+b}} dx = \frac{1}{\sqrt{b}} \log \left| \frac{\sqrt{ax+b}-\sqrt{b}}{\sqrt{ax+b}+\sqrt{b}} \right| + C, a \neq 0, b > 0 \circ$
14. $\int \frac{1}{x\sqrt{ax+b}} dx = \frac{2}{\sqrt{-b}} \arctan \sqrt{\frac{ax+b}{-b}} + C, a \neq 0, b < 0 \circ$
15. $\int \frac{1}{x^n \sqrt{ax+b}} dx = -\frac{1}{b(n-1)} \frac{\sqrt{ax+b}}{x^{n-1}} - \frac{(2n-3)a}{(2n-2)b} \int \frac{1}{x^{n-1} \sqrt{ax+b}} dx, ab \neq 0, n \neq 1 \circ$
16. $\int \frac{\sqrt{ax+b}}{x} dx = 2\sqrt{ax+b} + b \int \frac{1}{x\sqrt{ax+b}} dx, a \neq 0 \circ$
17. $\int \frac{1}{x^2-a^2} dx = \frac{1}{2a} \log \left| \frac{x-a}{x+a} \right| + C, a \neq 0 \circ$
18. $\int \sqrt{x^2 \pm a^2} dx = \frac{x}{2} \sqrt{x^2 \pm a^2} \pm \frac{a^2}{2} \log |x + \sqrt{x^2 \pm a^2}| + C \circ$
19. $\int \frac{1}{\sqrt{x^2 \pm a^2}} dx = \log |x + \sqrt{x^2 \pm a^2}| + C, a \neq 0 \circ$

20. $\int \sqrt{a^2 - x^2} dx = \frac{x}{2} \sqrt{a^2 - x^2} + \frac{a^2}{2} \arcsin \frac{x}{a} + C, a \neq 0 \circ$
21. $\int \frac{1}{(x^2+a^2)^n} dx = \frac{1}{2(n-1)a^2} \left\{ \frac{x}{(x^2+a^2)^{n-1}} + (2n-3) \int \frac{1}{(x^2+a^2)^{n-1}} dx \right\},$
 $a \neq 0, n \neq -1 \circ$
22. $\int x \sin x dx = \sin x - x \cos x + C \circ$
23. $\int x^n \sin x dx = -x^n \cos x + nx^{n-1} \sin x - n(n-1) \int x^{n-2} \sin x dx,$
 $n \geq 2 \circ$
24. $\int x \cos x dx = \cos x + x \sin x + C \circ$
25. $\int x^n \cos x dx = x^n \sin x + nx^{n-1} \cos x - n(n-1) \int x^{n-2} \cos x dx,$
 $n \geq 2 \circ$
26. $\int \sin^m x \cos^n x dx$
 $= \begin{cases} \frac{1}{m+n} (-\sin^{m-1} x \cos^{n+1} x + (m-1) \int \sin^{m-2} x \cos^n x dx) \\ \frac{1}{m+n} (\sin^{m+1} x \cos^{n-1} x + (n-1) \int \sin^m x \cos^{n-2} x dx), \end{cases}$
 $m+n \neq 0 \circ$
27. $\int \sin^n x dx = -\frac{1}{n} \sin^{n-1} x \cos x + \frac{n-1}{n} \int \sin^{n-2} x dx, n \geq 2 \circ$
28. $\int \sin^2 x dx = -\frac{1}{2} \sin x \cos x + \frac{x}{2} + C \circ$
29. $\int \cos^n x dx = \frac{1}{n} \sin x \cos^{n-1} x + \frac{n-1}{n} \int \cos^{n-2} x dx, n \geq 2 \circ$
30. $\int \cos^2 x dx = \frac{1}{2} \sin x \cos x + \frac{x}{2} + C \circ$
31. $\int \sin^2 x \cos^2 x dx = -\frac{1}{4} \sin x \cos^3 x + \frac{1}{8} \sin x \cos x + \frac{x}{8} + C \circ$
32. $\int \tan x dx = \log |\sec x| + C \circ$
33. $\int \tan^2 x dx = \tan x - x + C \circ$
34. $\int \tan^n x dx = \frac{1}{n-1} \tan^{n-1} x - \int \tan^{n-2} x dx, n \geq 2 \circ$
35. $\int \cot x dx = \log |\sin x| + C \circ$
36. $\int \sec x dx = \log |\sec x + \tan x| + C \circ$

37. $\int \sec^n x dx = \frac{1}{n-1}(\sec^{n-2} x \tan x + (n-2) \int \sec^{n-2} x dx),$
 $n \geq 2 \circ$
38. $\int x e^{ax} dx = \frac{1}{a^2}(ax - 1)e^{ax} + C, a \neq 0 \circ$
39. $\int x^n e^{ax} dx = \frac{x^n}{a} e^{ax} - \frac{n}{a} \int x^{n-1} e^{ax} dx, a \neq 0, n \geq 1 \circ$
40. $\int e^{ax} \sin bxdx = \frac{1}{a^2+b^2}(a \sin bx - b \cos bx)e^{ax} + C, a \neq 0 \circ$
41. $\int e^{ax} \cos bxdx = \frac{1}{a^2+b^2}(a \cos bx + b \sin bx)e^{ax} + C, a \neq 0 \circ$
42. $\int \log x dx = x \log x - x + C \circ$
43. $\int x^m \log^n x dx = \frac{1}{m+1}(x^{m+1} \log^n x - n \int x^m \log^{n-1} x dx),$
 $m \neq -1 \circ$
44. $\int \log^n x dx = x \log^n x - n \int \log^{n-1} x dx \circ$
45. $\int x^n \log x dx = \frac{x^{n+1}}{n+1}(\log x - \frac{1}{n+1}) + C, n \neq -1 \circ$
46. $\int \frac{\log^n x}{x} dx = \frac{1}{n+1} \log^{n+1} x + C, n \neq -1 \circ$
47. $\int \frac{1}{x \log x} dx = \log(\log x) + C \circ$
48. $\int \arcsin x dx = x \arcsin x + \sqrt{1-x^2} + C \circ$
49. $\int x^n \arcsin x dx = \frac{1}{n+1} x^{n+1} \arcsin x - \int \frac{x^{n+1}}{\sqrt{1-x^2}} dx, n \geq -1 \circ$
50. $\int \arctan x dx = x \arctan x - \frac{1}{2} \log(x^2 + 1) + C \circ$
51. $\int x^n \arctan x dx = \frac{1}{n+1}(x^{n+1} \arctan x - \int \frac{x^{n+1}}{x^2+1} dx), n \geq -1 \circ$
52. $\int \operatorname{arcsec} x dx = x \operatorname{arcsec} x - \log|x + \sqrt{x^2 - 1}| + C \circ$