

Tabla de integrales

formas elementales

1. $\int du = u + C$
2. $\int a du = au + C$
3. $\int u^n du = \frac{u^{n+1}}{n+1} + C \quad (n \neq -1)$
4. $\int \frac{du}{u} = \ln|u| + C$
5. $\int e^u du = e^u + C$
6. $\int a^u du = \frac{1}{\ln a} a^u + C$
7. $\int \operatorname{sen} u du = -\cos u + C$
8. $\int \operatorname{sen} k u du = -\frac{\cos k u}{k} + C$
9. $\int \cos u du = \operatorname{sen} u + C$
10. $\int \cos k u du = \frac{\operatorname{sen} k u}{k} + C$
11. $\int \sec^2 u du = \tan u + C$
12. $\int \csc^2 u du = -\cot u + C$
13. $\int \sec u \tan u du = \sec u + C$
14. $\int \csc u \cot u du = -\csc u + C$
15. $\int \tan u du = \ln|\sec u| + C = -\ln|\cos u| + C$
17. $\int \sec u du = \ln|\sec u + \tan u| + C$
16. $\int \cot u du = \ln|\operatorname{sen} u| + C$
18. $\int \csc u du = \ln|\csc u - \cot u| + C$
19. $\int \frac{du}{\sqrt{a^2 - u^2}} = \operatorname{sen}^{-1} \frac{u}{a} + C$
21. $\int \frac{du}{u\sqrt{u^2 - a^2}} = \frac{1}{a} \sec^{-1} \frac{u}{a} + C$
23. $\int \frac{du}{u^2 - a^2} = \frac{1}{2a} \ln \left| \frac{u-a}{u+a} \right| + C$
20. $\int \frac{du}{u^2 + a^2} = \frac{1}{a} \tan^{-1} \frac{u}{a} + C$
22. $\int \frac{du}{a^2 - u^2} = \frac{1}{2a} \ln \left| \frac{u+a}{u-a} \right| + C$
24. $\int u dv = uv - \int v du$ Integración por partes

1. Formas que contienen funciones trigonométricas

25. $\int \operatorname{sen}^2 u du = \frac{1}{2}u - \frac{1}{4} \operatorname{sen} 2u + C = \frac{1}{2}(u - \operatorname{sen} u \cos u) + C$
26. $\int \cos^2 u du = \frac{1}{2}u + \frac{1}{4} \operatorname{sen} 2u + C = \frac{1}{2}(u + \operatorname{sen} u \cos u) + C$
27. $\int \tan^2 u du = \tan u - u + C$
30. $\int \cos^3 u du = \frac{1}{3}(2 + \cos^2 u) \operatorname{sen} u + C$
28. $\int \cot^2 u du = -\cot u - u + C$
31. $\int \tan^3 u du = \frac{1}{2} \tan^2 u + \ln|\cos u| + C$
29. $\int \operatorname{sen}^3 u du = -\frac{1}{3}(2 + \operatorname{sen}^2 u) \cos u + C$
32. $\int \cot^3 u du = -\frac{1}{2} \cot^2 u - \ln|\operatorname{sen} u| + C$
33. $\int \sec^3 u du = \frac{1}{2} \sec u \tan u + \frac{1}{2} \ln|\sec u + \tan u| + C$
34. $\int \csc^3 u du = -\frac{1}{2} \csc u \cot u + \frac{1}{2} \ln|\csc u - \cot u| + C$
35. $\int \operatorname{sen}^n u du = -\frac{1}{n} \operatorname{sen}^{n-1} u \cos u + \frac{n-1}{n} \int \operatorname{sen}^{n-2} u du$
36. $\int \cos^n u du = \frac{1}{n} \cos^{n-1} u \operatorname{sen} u + \frac{n-1}{n} \int \cos^{n-2} u du$
37. $\int \tan^n u du = \frac{1}{n-1} \tan^{n-1} u - \int \tan^{n-2} u du$

$$38. \int \cot^n u du = -\frac{1}{n-1} \cot^{n-1} u - \int \cot^{n-2} u du$$

$$39. \int \sec^n u du = \frac{1}{n-1} \sec^{n-2} u \tan u + \frac{n-2}{n-1} \int \sec^{n-2} u du$$

$$40. \int \csc^n u du = -\frac{1}{n-1} \csc^{n-2} u \cot u + \frac{n-2}{n-1} \int \csc^{n-2} u du$$

$$41. \int \operatorname{sen} a u \operatorname{sen} b u du = \frac{\operatorname{sen}(a-b)u}{2(a-b)} - \frac{\operatorname{sen}(a+b)u}{2(a+b)} + C$$

$$42. \int \cos a u \cos b u du = \frac{\operatorname{sen}(a-b)u}{2(a-b)} + \frac{\operatorname{sen}(a+b)u}{2(a+b)} + C$$

$$43. \int \operatorname{sen} a u \cos b u du = -\frac{\cos(a-b)u}{2(a-b)} - \frac{\cos(a+b)u}{2(a+b)} + C$$

$$44. \int u \operatorname{sen} u du = \operatorname{sen} u - u \cos u + C$$

$$46. \int u^n \operatorname{sen} u du = -u^n \cos u + n \int u^{n-1} \cos u du$$

$$45. \int u \cos u du = \cos u + u \operatorname{sen} u + C$$

$$47. \int u^n \cos u du = u^n \operatorname{sen} u - n \int u^{n-1} \operatorname{sen} u du$$

$$\begin{aligned} 48. \int \operatorname{sen}^n u \cos^m u du &= -\frac{\operatorname{sen}^{n-1} u \cos^{m+1} u}{n+m} + \frac{n-1}{n+m} \int \operatorname{sen}^{n-2} u \cos^m u du \\ &= \frac{\operatorname{sen}^{n+1} u \cos^{m-1} u}{n+m} + \frac{m-1}{n+m} \int \operatorname{sen}^n u \cos^{m-2} u du \end{aligned}$$

2. Formas que contienen funciones trigonométricas inversas

$$49. \int \operatorname{sen}^{-1} u du = u \operatorname{sen}^{-1} u + \sqrt{1-u^2} + C$$

$$52. \int u \operatorname{sen}^{-1} u du = \frac{2u^2-1}{4} \operatorname{sen}^{-1} u + \frac{u\sqrt{1-u^2}}{4} + C$$

$$50. \int \cos^{-1} u du = u \cos^{-1} u - \sqrt{1-u^2} + C$$

$$53. \int u \cos^{-1} u du = \frac{2u^2-1}{4} \cos^{-1} u - \frac{u\sqrt{1-u^2}}{4} + C$$

$$51. \int \tan^{-1} u du = u \tan^{-1} u - \frac{1}{2} \ln(1+u^2) + C$$

$$54. \int u \tan^{-1} u du = \frac{u^2+1}{2} \tan^{-1} u - \frac{u}{2} + C$$

$$55. \int u^n \operatorname{sen}^{-1} u du = \frac{1}{n+1} \left[u^{n+1} \operatorname{sen}^{-1} u - \int \frac{u^{n+1} du}{\sqrt{1-u^2}} \right] + C; \quad n \neq -1$$

$$56. \int u^n \cos^{-1} u du = \frac{1}{n+1} \left[u^{n+1} \cos^{-1} u + \int \frac{u^{n+1} du}{\sqrt{1-u^2}} \right] + C; \quad n \neq -1$$

$$57. \int u^n \tan^{-1} u du = \frac{1}{n+1} \left[u^{n+1} \tan^{-1} u - \int \frac{u^{n+1} du}{1+u^2} \right] + C; \quad n \neq -1$$

3. Formas exponenciales y logarítmicas

$$58. \int e^{au} du = \frac{e^{au}}{a} + C$$

$$61. \int u^n e^{au} du = \frac{1}{a} u^n e^{au} - \frac{n}{a} \int u^{n-1} e^{au} du + C$$

$$59. \int u e^{au} du = \frac{e^{au}}{a} \left(u - \frac{1}{a} \right) + C = \frac{1}{a^2} (au - 1) e^{au} + C$$

$$62. \int e^{au} \operatorname{sen} bu du = \frac{e^{au}}{a^2 + b^2} (a \operatorname{sen} bu - b \cos bu) + C$$

$$60. \int u^2 e^{au} du = \frac{e^{au}}{a} \left(u^2 - \frac{2u}{a} + \frac{2}{a^2} \right) + C$$

$$63. \int e^{au} \cos bu du = \frac{e^{au}}{a^2 + b^2} (a \cos bu + b \operatorname{sen} bu) + C$$

$$64. \int x e^{au} \operatorname{sen} bu du = \frac{x e^{au} (a \operatorname{sen} bu - b \cos bu)}{a^2 + b^2} - \frac{e^{au} [(a^2 - b^2) \operatorname{sen} bu - 2ab \cos bu]}{(a^2 + b^2)^2} + C$$

$$65. \int x e^{au} \cos bu du = \frac{x e^{au} (a \cos bu + b \operatorname{sen} bu)}{a^2 + b^2} - \frac{e^{au} [(a^2 - b^2) \cos bu + 2ab \operatorname{sen} bu]}{(a^2 + b^2)^2} + C$$

$$66. \int \ln u du = u \ln u - u + C$$

$$67. \int u \ln u du = \frac{u^2}{2} \left(\ln u - \frac{1}{2} \right) + C$$

$$68. \int u^n \ln u du = \frac{u^{n+1}}{n+1} \left(\ln u - \frac{1}{n+1} \right) + C = \frac{u^{n+1}}{(n+1)^2} [(n+1) \ln u - 1] + C$$

$$69. \int \frac{\ln u}{u} du = \frac{1}{2} \ln^2 u + C$$

$$72. \int \frac{\ln^n u}{u} du = \frac{\ln^{n+1} u}{n+1} + C$$

$$70. \int \frac{\ln u}{u^2} du = -\frac{\ln u}{u} - \frac{1}{u} + C$$

$$71. \int \ln^2 u du = u \ln^2 u - 2u \ln u + 2u + C$$

$$73. \int \frac{du}{u \ln u} = \ln |\ln u| + C$$