Integrales

1. $\int (du + dv) = \int du + \int dv + c$

2. $\int a\, du = a \int du + c$

3. $\int dx = x + c$

4. $\int u^n\, du = \dfrac{u^{n+1}}{n+1} + c,\, n \neq -1$

5. $\int \dfrac{du}{u} = ln\,|u| + c$

6. $\int a^u\, du = \dfrac{a^u}{ln\,a} + c$

7. $\int e^u\, du = e^u + c$

8. $\int \operatorname{sen} u\, du = -\cos\,u + c$

9. $\int \cos\,u\, du = sen\,u + c$

10. $\int \sec^2\,u\, du = tan\,u + c$

11. $\int \csc^2\,u\, du = -\cot\,u + c$

12. $\int \sec\,u\,\tan\,u\, du = \sec\,u + c$

13. $\int \csc u\,\cot\,u\, du = -\csc\,u + c$

14. $\int \tan\,u\, du = -ln\,\cos\,u + c$

15. $\int \cot\,u\, du = \ln\,sen\,u + c$

16. $\int \sec\,u\, du = \ln|\sec\,u + \tan\,u| + c$

17. $\int \csc u\, du = \ln|\csc u - \cot\,u| + c$

18. $\int \dfrac{du}{u^2 + a^2} = \dfrac{1}{a}\arctan\,\dfrac{u}{a} + c$

19. $\int \dfrac{du}{u^2 - a^2} = \dfrac{1}{2a}\ln\left|\dfrac{u-a}{u+a}\right| + c,\, u^2 > a^2$

20. $\int \dfrac{du}{a^2 - u^2} = \dfrac{1}{2a}\ln\left|\dfrac{a+u}{a-u}\right| + c,\, u^2 > a^2$

21. $\int \dfrac{du}{\sqrt{a^2 - u^2}} = arcsen\dfrac{u}{a} + c$

22. $\int \dfrac{du}{\sqrt{u^2 \pm a^2}} = \ln|u + \sqrt{u^2 \pm a^2}| + c$

23. $\int \sqrt{a^2 - u^2}\, du = \dfrac{u}{2}\sqrt{a^2 - u^2} + \dfrac{a^2}{2}arcsen\,\dfrac{u}{a} + c$

24. $\int \sqrt{u^2 \pm a^2}\, du = \dfrac{u}{2}\sqrt{u^2 \pm a^2} \pm \dfrac{a^2}{2}\ln|u + \sqrt{u^2 \pm a^2}| + c$

25. $\int \dfrac{du}{u\sqrt{u^2 - a^2}} = \dfrac{1}{a}arcsec\dfrac{u}{a} + c$

Integración por partes

26. $\int u\, dv = uv - \int v\, du$

Fórmulas de reducción

27. $\int \operatorname{sen}^2 v\, dv = \frac{1}{2}v - \frac{1}{4}\operatorname{sen} 2v + c$

28. $\int \cos^2\,v\, dv = \frac{1}{2}v + \frac{1}{4}\operatorname{sen} 2v + c$

29. $\int \tan^2\,v\, dv = \tan\,v - v + c$

30. $\int \cot^2\,v\, dv = -\cot\,v - v + c$

31. $\int \operatorname{sen}^3 v\, dv = -\frac{1}{3}(2 + \operatorname{sen}^2 v)\cos\,v + c$

32. $\int \cos^3\,v\, dv = \frac{1}{3}(2 + \cos^2\,v)sen\,v + c$

33. $\int \tan^3\,v\, dv = \frac{1}{2}\tan^2\,v + \ln|\cos v| + c$

34. $\int \cot^3\,v\, dv = -\frac{1}{2}\cot^2\,v - \ln|sen\,v| + c$

35. $\int \sec^3\,v\, dv = \frac{1}{2}\sec\,v\,\tan\,v + \frac{1}{2}\ln|\sec\,v + \tan\,v| + c$

36. $\int \csc^3 v\, dv = -\frac{1}{2}\csc\,v\,\cot\,v + \frac{1}{2}\ln|\csc v - \cot\,v| + c$

37. $\int v\,\operatorname{sen} v\, dv = \operatorname{sen} v - v\cos\,v + c$

38. $\int v\,\cos\,v\, dv = \cos\,v + v\operatorname{sen} v + c$

39. $\int \operatorname{arcsen} v\, dv = v\operatorname{arcsen} v + \sqrt{1 - v^2} + c$

40. $\int \operatorname{arccos}\,v\, dv = v\operatorname{arccos}\,v - \sqrt{1 - v^2} + c$

41. $\int \arctan\,v\, dv = v\arctan\,v - \frac{1}{2}\ln|1 + v^2| + c$

42. $\int v\,\operatorname{arcsen} v\, dv = \dfrac{2v^2 - 1}{4}\operatorname{arcsen} v + \dfrac{v\sqrt{1 - v^2}}{4} + c$

43. $\int v\,\operatorname{arccos}\,v\, dv = \dfrac{2v^2 - 1}{4}\operatorname{arccos}\,v - \dfrac{v\sqrt{1 - v^2}}{4} + c$

44. $\int u\,e^{au}du = \dfrac{1}{a^2}(au - 1)e^{au} + c$

45. $\int e^{au}\operatorname{sen} bu\, du = \dfrac{e^{au}}{a^2 + b^2}(a\,\operatorname{sen} bu - b\,\cos\,bu) + c$

46. $\int e^{au}\cos\,bu\, du = \dfrac{e^{au}}{a^2 + b^2}(a\,\cos\,bu + b\,\operatorname{sen} bu) + c$

47. $\int \ln u\, du = u\ln u - u + C$

48. $\int \dfrac{du}{u\,\ln u} = \ln|\ln u| + C$

49. $\int \ln(u^2 + a^2)du = u\ln(u^2 + a^2) - 2u + 2a\arctan\frac{u}{a} + c$

50. $\int \ln|u^2 - a^2|du = u\ln|u^2 - a^2| - 2u + a\ln\left|\dfrac{u+a}{u-a}\right| + c$

51. $\int \operatorname{senh} u\, du = \cosh u + c$

52. $\int \cosh u\, du = \operatorname{senh} u + c$

53. $\int \tanh u\, du = \ln\,\cosh u + c$

54. $\int \coth u\, du = \ln\,\operatorname{senh} u + c$

55. $\int \operatorname{sech}^2 u\, du = \tanh u + c$

56. $\int \operatorname{csch}^2 u\, du = -\coth u + c$

57. $\int \operatorname{sech} u\,\tanh u\, du = -\operatorname{sech} u + c$

58. $\int \operatorname{csch} u\,\coth u\, du = -\operatorname{csch} u + c$

59. $\int u^2\sqrt{u^2 \pm a^2}du = \dfrac{u}{8}(2u^2 \pm a^2)\sqrt{u^2 \pm a^2} - \dfrac{a^4}{8}\ln|u + \sqrt{u^2 \pm a^2}| + c$

60. $\int \dfrac{\sqrt{u^2 + a^2}}{u}du = \sqrt{u^2 + a^2} - a\ln\left|\dfrac{a + \sqrt{u^2 + a^2}}{u}\right| + c$

61. $\int \dfrac{\sqrt{u^2 \pm a^2}}{u^2}du = -\dfrac{\sqrt{u^2 \pm a^2}}{u} + \ln|u + \sqrt{u^2 \pm a^2}| + c$

62. $\int \dfrac{u^2}{\sqrt{u^2 \pm a^2}}du = \dfrac{u}{2}\sqrt{u^2 \pm a^2} \mp \dfrac{a^2}{2}\ln|u + \sqrt{u^2 \pm a^2}| + c$

63. $\int \dfrac{du}{u\sqrt{u^2 + a^2}} = -\dfrac{1}{a}\ln\left|\dfrac{a + \sqrt{u^2 + a^2}}{u}\right| + c$

64. $\int \dfrac{du}{u^2\sqrt{u^2 \pm a^2}} = \dfrac{\sqrt{u^2 \pm a^2}}{a^2 u} + c$

65. $\int \dfrac{\sqrt{u^2 - a^2}}{u}du = \sqrt{u^2 - a^2} - a\,\operatorname{arccos}\dfrac{a}{u} + c$

66. $\int \dfrac{du}{(u^2 - a^2)^{3/2}} = \dfrac{u}{a^2\sqrt{u^2 - a^2}} + c$

67. $\int u^2\sqrt{a^2 - u^2}du = \dfrac{u}{8}(2u^2 - a^2)\sqrt{a^2 - u^2} + \dfrac{a^4}{8}\operatorname{arcsen}\dfrac{u}{a} + c$

Derivadas

1. $\frac{d}{dx}(c) = 0$

2. $\frac{d}{dx}(x) = 1$

3. $\frac{d}{dx}(cu) = c\,\frac{du}{dx}$

4. $\frac{d}{dx}(u+v) = \frac{du}{dx} + \frac{dv}{dx}$

5. $\frac{d}{dx}(x^n) = n\,x^{n-1}$

6. $\frac{d}{dx}(u^n) = n\,u^{n-1}\frac{du}{dx}$

7. $\frac{d}{dx}(u \cdot v) = u\,\frac{dv}{dx} + v\,\frac{du}{dx}$

8. $\frac{d}{dx}\left(\frac{u}{v}\right) = \frac{v\,\frac{du}{dx} - u\,\frac{dv}{dx}}{v^2}$

9. $\frac{d}{dx}(\text{sen } u) = \cos u\,\frac{du}{dx}$

10. $\frac{d}{dx}(\cos\ u) = -\text{sen}u\,\frac{du}{dx}$

11. $\frac{d}{dx}(\tan\ u) = \sec^2 u\,\frac{du}{dx}$

12. $\frac{d}{dx}(\cot\ u) = -\csc^2 u\frac{du}{dx}$

13. $\frac{d}{dx}(\sec\ u) = \sec u\,\tan u\,\frac{du}{dx}$

14. $\frac{d}{dx}(\csc\ u) = -\csc u\,\cot u\,\frac{du}{dx}$

15. $\frac{d}{dx}(\text{arcsen } u) = \frac{1}{\sqrt{1-u^2}}\,\frac{du}{dx}$

16. $\frac{d}{dx}(\text{arccos } u) = -\frac{1}{\sqrt{1-u^2}}\,\frac{du}{dx}$

17. $\frac{d}{dx}(\arctan\ u) = \frac{1}{1+u^2}\,\frac{du}{dx}$

18. $\frac{d}{dx}(\text{arccot } u) = -\frac{1}{1+u^2}\,\frac{du}{dx}$

19. $\frac{d}{dx}(\text{arcsec } u) = \frac{1}{u\sqrt{u^2-1}}\,\frac{du}{dx}$

20. $\frac{d}{dx}(\text{arccsc } u) = -\frac{1}{u\sqrt{u^2-1}}\,\frac{du}{dx}$

21. $\frac{d}{dx}(\log_a u) = \frac{1}{u}\log_a e\,\frac{du}{dx}$

22. $\frac{d}{dx}(\ln u) = \frac{1}{u}\,\frac{du}{dx}$

23. $\frac{d}{dx}(a^u) = a^u\,\ln a\,\frac{du}{dx}$

24. $\frac{d}{dx}(e^u) = e^u\,\frac{du}{dx}$

25. $\frac{d}{dx}(u^v) = v\,u^{v-1}\frac{du}{dx} + u^v\ln u\,\frac{dv}{dx}$

Regla de la cadena

$$\frac{df}{du} \cdot \frac{du}{dx} = \frac{df}{dx}$$

$$df = \frac{\partial f}{\partial x}dx + \frac{\partial f}{\partial y}dy$$

Propiedades de los logaritmos Si A y B son números reales positivos

- $\log A + \log B = \log(AB)$
- $\log A - \log B = \log(\frac{A}{B})$
- $r \cdot \log B = \log B^r$

Identidades Trigonométricas

1. $\csc A = \frac{1}{\text{sen } A}$

2. $\sec A = \frac{1}{\cos A}$

3. $\cot A = \frac{1}{\tan A}$

4. $\tan A = \frac{\text{sen } A}{\cos A}$

5. $\cot A = \frac{\cos A}{\text{sen } A}$

6. $\text{sen}^2 A + \cos^2 A = 1$

7. $\tan^2 A + 1 = \sec^2 A$

8. $1 + \cot^2 A = \csc^2 A$

9. $\text{sen}^2 A = \frac{1}{2} - \frac{1}{2}\cos 2A$

10. $\cos^2 A = \frac{1}{2} + \frac{1}{2}\cos 2A$

11. $\text{sen } 2A = 2\,\text{sen } A \cos A$

12. $\cos 2A = \cos^2 A - \text{sen}^2 A$

Ángulos Compuestos

13. $2\text{sen}A\,\text{sen}B = \cos(A-B) - \cos(A+B)$

14. $2\text{sen}A\,\cos B = \text{sen}(A+B) + \text{sen}(A-B)$

15. $2\cos A\,\text{sen}B = \text{sen}(A+B) - \text{sen}(A-B)$

16. $2\cos A\,\cos B = \cos(A+B) + \cos(A-B)$

17. $\text{sen}(A+B) = \text{sen } A \cos B + \cos A\,\text{sen } B$

18. $\text{sen}(A-B) = \text{sen } A \cos B - \cos A\,\text{sen } B$

19. $\cos(A+B) = \cos A \cos B - \text{sen } A\,\text{sen } B$

20. $\cos(A-B) = \cos A \cos B + \text{sen } A\,\text{sen } B$

21. $\tan(2A) = \frac{2\tan A}{1-\tan^2 A}$

22. $\tan\frac{A}{2} = \frac{1-\cos A}{\text{sen } A}$

Transformada de Laplace

1. $\mathscr{L}\{1\} = \frac{1}{s}$

2. $\mathscr{L}\{t\} = \frac{1}{s^2}$

3. $\mathscr{L}\{t^n\} = \frac{n!}{s^{n+1}}, \, n \in Z^+$

4. $\mathscr{L}\{e^{at}\} = \frac{1}{s-a}$

5. $\mathscr{L}\{\text{sen } kt\} = \frac{k}{s^2+k^2}$

6. $\mathscr{L}\{\cos\ kt\} = \frac{s}{s^2+k^2}$

7. $\mathscr{L}\{\text{senh } kt\} = \frac{k}{s^2-k^2}$

8. $\mathscr{L}\{\cosh\ kt\} = \frac{s}{s^2-k^2}$

9. $\mathscr{L}\{e^{at}f(t)\} = F(s-a)$

10. $\mathscr{L}\{\mathscr{U}(t)\} = \frac{e^{-as}}{s}$

11. $\mathscr{L}\{f(t-a)\mathscr{U}(t-a)\} = e^{-as}F(s)$

12. $\mathscr{L}\{f^{(n)}(t)\} = s^n F(s) - s^{n-1}f(0) - ... - f^{(n-1)(0)}$

13. $\mathscr{L}\{t^n f(t)\} = (-1)^n \frac{d^n}{ds^n}F(s)$