Tabela geral das Derivadas

Nesta tabela u e v são funções deriváveis de x e c, α e *a* são constantes.

(1) $y = c \Rightarrow y' = 0$

(2) $y = x \Rightarrow y' = 1$

(3) $y = c \cdot u \Rightarrow y' = c \cdot u'$

(4) $y = u + v \Rightarrow y' = u' + v'$

(5) $y = u \cdot v \Rightarrow y' = u' \cdot v + u \cdot v'$

(6) $y = \frac{u}{v} \Rightarrow y' = \frac{u' \cdot v - u \cdot v'}{v^2}$

(7) $y = u^{\alpha}$, $(\alpha \neq 0) \Rightarrow y' = \alpha \cdot u^{\alpha - 1} \cdot u'$

(8) $y = a^{u}$ $(a>0, a \neq 1) \Rightarrow y' = a^{u} \cdot \ln a \cdot u'$

(9) $y = e^{u} \Rightarrow y' = e^{u} \cdot u'$

(10) $y = \log_a u \Rightarrow y' = \frac{u'}{u} \log_a e$

(11) $y = \ln u \Rightarrow y' = \frac{u'}{u}$

(12) $y = u^{v}$ $(u>0)$

$\Rightarrow y' = v \cdot u^{v-1} \cdot u' + u^{v} \cdot \ln u \cdot v'$

(13) $y = \text{sen } u \Rightarrow y' = \cos u \cdot u'$

(14) $y = \cos u \Rightarrow y' = -\text{sen } u \cdot u'$

(15) $y = \text{tg } u \Rightarrow y' = \sec^2 u \cdot u'$

(16) $y = \text{cotg } u \Rightarrow y' = -\text{cosec}^2 u \cdot u'$

(17) $y = \sec u \Rightarrow y' = \sec u \cdot \text{tg } u \cdot u'$

(18) $y = \text{cosec } u$

$\Rightarrow y' = -\text{cosec } u \cdot \text{cotg } u \cdot u'$

(19) $y = \text{arc sen } u \Rightarrow y' = \frac{u'}{\sqrt{1-u^2}}$

(20) $y = \text{arc cos } u \Rightarrow y' = \frac{-u'}{\sqrt{1-u^2}}$

(21) $y = \text{arc tg } u \Rightarrow y' = \frac{u'}{1+u^2}$

(22) $y = \text{arc cotg } u \Rightarrow y' = \frac{-u'}{1+u^2}$

(23) $y = \text{arc sec } u$, $|u| \geq 1$

$\Rightarrow y' = \frac{u'}{|u|\sqrt{u^2-1}}$, $|u| > 1$

(24) $y = \text{arc cosec } u$, $|u| \geq 1$

$\Rightarrow y' = \frac{-u'}{|u|\sqrt{u^2-1}}$, $|u| > 1$

(25) $y = \text{senh } u \Rightarrow y' = \cosh u \cdot u'$

(26) $y = \cosh u \Rightarrow y' = \text{senh } u \cdot u'$

(27) $y = \text{tgh } u \Rightarrow y' = \text{sech}^2 u \cdot u'$

(28) $y = \text{cotgh } u \Rightarrow y' = -\text{cosech}^2 u \cdot u'$

(29) $y = \text{sech } u \Rightarrow y' = -\text{sech } u \cdot \text{tgh } u \cdot u'$

(30) $y = \text{cosech } u$

$\Rightarrow y' = -\text{cosech } u \cdot \text{cotgh } u \cdot u'$

(31) $y = \text{arg senh } u \Rightarrow y' = \frac{u'}{\sqrt{u^2+1}}$

(32) $y = \text{arg cosh } u \Rightarrow y' = \frac{u'}{\sqrt{u^2-1}}$, $u > 1$

(33) $y = \text{arg tgh } u \Rightarrow y' = \frac{u'}{1-u^2}$, $|u| < 1$

(34) $y = \text{arg cotgh } u \Rightarrow y' = \frac{u'}{1-u^2}$, $|u| > 1$

(35) $y = \text{arg sech } u \Rightarrow y' = \frac{-u'}{u\sqrt{1-u^2}}$, $0 < u < 1$

(36) $y = \text{arg cosech } u \Rightarrow y' = \frac{-u'}{|u|\sqrt{1+u^2}}$, $u \neq 0$

Identidades Trigonométricas

1. $\text{sen}^2 x + \cos^2 x = 1$.
2. $1 + \text{tg}^2 x = \sec^2 x$.
3. $1 + \text{cotg}^2 x = \text{cosec}^2 x$.
4. $\text{sen}^2 x = \frac{1 - \cos 2x}{2}$.

5. $\cos^2 x = \dfrac{1+\cos 2x}{2}$.

6. $\text{sen } 2x = 2 \text{ sen } x \cos x$.

7. $2 \text{ sen } x \cos y = \text{sen}(x-y) + sen(x+y)$.

8. $2 \text{ sen } x \text{ sen } y = \cos(x-y) - \cos(x+y)$.

9. $2 \cos x \cos y = \cos(x-y) + \cos(x+y)$.

10. $1 \pm \text{sen } x = 1 \pm \cos\left(\dfrac{\pi}{2} - x\right)$.

11. $\text{cosec}\, x = \dfrac{1}{\text{sen}\, x}$

12. $\sec x = \dfrac{1}{\cos x}$

13. $\text{tg}\, x = \dfrac{\text{sen}\, x}{\cos x}$

14. $\text{cotg}\, x = \dfrac{\cos x}{\text{sen}\, x} = \dfrac{1}{\text{tg}\, x}$

Funções hiperbólicas

$\cosh x = \dfrac{e^x + e^{-x}}{2}$ $\qquad$ $\text{senh}\, x = \dfrac{e^x - e^{-x}}{2}$ $\qquad$ $\text{tgh}\, x = \dfrac{e^x - e^{-x}}{e^x + e^{-x}}$

Integrais

1. $\int du = u + c$.

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

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

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

5. $\int e^u du = e^u + c$.

6. $\int a^u du = \dfrac{a^u}{\ln a} + c, \quad a > 0, a \neq 1$.

7. $\int e^{au} = \frac{1}{a} . e^{au} + \text{c}$

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

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

10. $\int \text{tg } u\, du = \ln|\sec u| + c$.

11. $\int \text{cotg } u\, du = \ln|\text{sen } u| + c$.

12. $\int \sec u\, du = \ln|\sec u + \text{tg } u| + c$.

13. $\int \text{cosec } u\, du = \ln|\text{cosec } u - \text{cotg } u| + c$.

14. $\int \sec u \text{ tg } u\, du = \sec u + c$.

15. $\int \text{cosec } u \text{ cotg } u\, du = -\text{cosec } u + c$.

16. $\int \sec^2 u\, du = \text{tg } u + c$.

17. $\int \text{cosec}^2 u\, du = -\text{cotg } u + c$.

18. $\int sen^2 u\, du = \frac{1}{2} . u - \frac{1}{4} . \text{sen } 2u + c$

19. $\int cos^2 u\, du = \frac{1}{2} . u + \frac{1}{4} . \text{sen } 2u + c$

20. $\int cotg^2 u\, du = -\text{cotg}\, u - u + c$

21. $\int tg^2 u\, du = \text{tg}\, u - u + c$

22. $\int \dfrac{du}{u^2 + a^2} = \dfrac{1}{a} arc \text{ tg} \dfrac{u}{a} + c$

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

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

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

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

27. $\int \dfrac{1}{u^2\sqrt{u^2 \pm a^2}} du = -\dfrac{\sqrt{u^2 \pm a^2}}{\pm a^2 u}$

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

29. $\int \dfrac{du}{\sqrt{a^2 - u^2}} = arc \text{ sen} \dfrac{u}{a} + c, \quad u^2 < a^2$.

30. $\int \dfrac{\sqrt{a^2 - u^2}}{u^2} du = -\dfrac{\sqrt{a^2 - u^2}}{u} - \text{arc sen} \dfrac{u}{a} + \text{c}$

31. $\int \frac{u^2}{\sqrt{a^2 - u^2}} du = -\frac{u}{2}\sqrt{a^2 - u^2} + \frac{a^2}{2} \text{arc sen} \frac{u}{a} + \text{c}$

32. $\int \frac{1}{u^2\sqrt{a^2 - u^2}} du = -\frac{\sqrt{a^2 - u^2}}{a^2 u} + \text{c}$

33. $\int \sqrt{a^2 - u^2}\, du = \frac{u}{2}\sqrt{a^2 - u^2} + \frac{a^2}{2} \text{arc sen} \frac{u}{a} + \text{c}$.