**Tabela Básica de Integrais Indefinidas**

Considere: **u**, **v** como funções;
**a**, **b**, **n** como constantes.

**Propriedade** (linearidade) : $\int a\,du = a\int du$ $\qquad$ $\int (au+bv)du = a\int udu + b\int vdu$

**Fórmulas generalizadas:**

| | |
|---|---|
| 1) $\int du = u + C$ | 11) $\int \operatorname{cosec} u\,du = \ln\lvert \operatorname{cosec} u - \operatorname{cotg} u\rvert + C$ |
| 2) $\int u^n du = \dfrac{u^{n+1}}{n+1} + C \quad (n \neq -1)$ | 12) $\int \sec^2 u\,du = \operatorname{tg} u + C$ |
| 3) $\int \dfrac{1}{u} du = \ln\lvert u\rvert + C$ | 13) $\int \operatorname{cosec}^2 u\,du = -\operatorname{cotg} u + C$ |
| 4) $\int e^u du = e^u + C$ | 14) $\int \operatorname{senh} u\,du = \cosh u + C$ |
| 5) $\int a^u du = \dfrac{a^u}{\ln a} + C$ | 15) $\int \cosh u\,du = \operatorname{senh} u + C$ |
| 6) $\int \operatorname{sen} u\,du = -\cos u + C$ | 16) $\int \dfrac{du}{u^2+a^2} = \dfrac{1}{a}\operatorname{arctg}\dfrac{u}{a} + C$ |
| 7) $\int \cos u\,du = \operatorname{sen} u + C$ | 17) $\int \dfrac{du}{u^2-a^2} = \dfrac{1}{2a}\ln\left(\dfrac{u-a}{u+a}\right) + C$ |
| 8) $\int \operatorname{tg} u\,du = \ln\lvert \sec u\rvert + C$ | 18) $\int \dfrac{du}{a^2-u^2} = \dfrac{1}{2a}\ln\left(\dfrac{a+u}{a-u}\right) + C$ |
| 9) $\int \operatorname{cotg} u\,du = \ln\lvert \operatorname{se} n u\rvert + C$ | 19) $\int \dfrac{du}{\sqrt{u^2+a^2}} = \ln\left(u+\sqrt{u^2+a^2}\right) + C \;=\; \operatorname{arcsenh}\dfrac{u}{a} + C$ |
| 10) $\int \sec u\,du = \ln\lvert \sec u + \operatorname{tg} u\rvert + C$ | 20) $\int \dfrac{du}{\sqrt{u^2-a^2}} = \ln\left(u+\sqrt{u^2-a^2}\right) + C$ |

**Fórmulas de Recorrência:**

$$\int \operatorname{sen}^n u\,du = -\frac{1}{n}\operatorname{sen}^{n-1} u \,.\, \cos u + \frac{n-1}{n}\int \operatorname{sen}^{n-2} u\,du$$

$$\int \cos^n u\,du = \frac{1}{n}\cos^{n-1} u \,.\, \operatorname{sen} u + \frac{n-1}{n}\int \cos^{n-2} u\,du$$

**Integral por partes:** $\int u\,dv = uv - \int v\,du$

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# Tabela de Derivadas

Considere: $u = u(x)$ , $v = v(x)$ , $y' = \frac{dy}{dx}$ e $u' = \frac{du}{dx}$

"k" , "a" e "$\alpha$" como constantes.

Propriedade: Linearidade $\frac{d}{dx}(k u + v) = k \frac{d}{dx}(u) + \frac{d}{dx}(v)$

**Fórmulas:**

| | | | |
|---|---|---|---|
| 1) | $y = k$ | $y' = 0$ | |
| 2) | $y = k u$ | $y' = k u'$ | |
| 3) | $y = u^{\alpha}$ | $y' = \alpha u^{\alpha-1} u'$ | |
| 4) | $y = a^u$ , $a \neq 1$ e $a > 0$ | $y' = \ln a \; a^u \; u'$ | |
| 5) | $y = e^u$ | $y' = e^u u'$ | |
| 6) | $y = \log_a u$ | $y' = \frac{1}{\ln a} \frac{u'}{u}$ | |
| 7) | $y = \ln u$ | $y' = \frac{u'}{u}$ | |
| 8) | $y = u.v$ | $y' = u.v' + v.u'$ | |
| 9) | $y = \frac{u}{v}$ | $y' = \frac{v.u' - u.v'}{v^2}$ | |
| 10) | $y = u^v$ | $y' = v u^{v-1} u' + u^v \ln u \; v'$ | |
| 11) | $y = sen\, u$ | $y' = u' \cos u$ | |
| 12) | $y = \cos u$ | $y' = -u' \; sen\, u$ | |
| 13) | $y = tg\, u$ | $y' = u' \; sec^2 u$ | |
| 14) | $y = cotg\, u$ | $y' = -u' \; cosec^2 u$ | |
| 15) | $y = sec\, u$ | $y' = u' \; tg\, u \; sec\, u$ | |
| 16) | $y = cosec\, u$ | $y' = -u' \; cotg\, u \; cosec\, u$ | |
| 17) | $y = arcsen\, u$ | $y' = \frac{1}{\sqrt{1-u^2}} \; u'$ | |
| 18) | $y = arctg\, u$ | $y' = \frac{1}{1+u^2} \; u'$ | |
| 19) | $y = senh\, u$ | $y' = u' \; cosh\, u$ | |
| 20) | $y = cosh\, u$ | $y' = u' \; senh\, u$ | |

Regra da Cadeia: $u = u(x)$ e $x = x(t)$ então: $\frac{du}{dt} = \frac{du}{dx} . \frac{dx}{dt}$ (função composta)

Paramétrica: $y = y(t)$ e $x = x(t)$ então: $\frac{dy}{dx} = \frac{\frac{dy}{dt}}{\frac{dx}{dt}}$