Regras de Derivação - Formulário

Considerando que u e v são funções reais de variável real x e que $a, b, k \in \mathbb{R}$, tem-se

$(ax+k)' = a$ casos particulares: $(x)' = 1$ $(k)' = 0$ (k=const.)

$(u \pm v)' = u' \pm v'$ $(u \times v)' = u' \times v + u \times v'$ $(k \times u)' = k \times u'$

$\left(\dfrac{u}{v}\right)' = \dfrac{u' \times v - u \times v'}{v^2}$ $(u(v))' = v' \times u'(v)$ $\left(u^k\right)' = k\, u' u^{k-1}$ $(k \neq -1)$

$(\ln u)' = \dfrac{u'}{u}$ $(u(x) > 0)$ $(\log_a u)' = \dfrac{u'}{u} \log_a e$ $(a \in \mathbb{R}^+ \setminus \{1\}, u(x) > 0)$ $(a^u)' = u' a^u \ln a$ $(a \in \mathbb{R}^+ \setminus \{1\})$

$(e^u)' = u'\ e^u$ $(u^v)' = v\, u^{(v-1)}\, u' + v'\, u^v\ \ln u$ $(u(x) > 0)$ $(\cos u)' = -u' \operatorname{sen} u$

$(\operatorname{sen} u)' = u' \cos u$ $(\operatorname{tg} u)' = \dfrac{u'}{\cos^2 u}$ $(\operatorname{cotg} u)' = \dfrac{-u'}{\operatorname{sen}^2 u}$

$(\sec u)' = \dfrac{u' \operatorname{sen} u}{\cos^2 u}$ $(\operatorname{cosec} u)' = \dfrac{-u' \cos u}{\operatorname{sen}^2 u}$ $(\arccos u)' = \dfrac{-u'}{\sqrt{1-u^2}}$

$(\operatorname{arcsen} u)' = \dfrac{u'}{\sqrt{1-u^2}}$ $(\operatorname{arctg} u)' = \dfrac{u'}{1+u^2}$ $(\operatorname{arccotg} u)' = \dfrac{-u'}{1+u^2}$

$(\operatorname{ch} u)' = u' \operatorname{sh} u$ $(\operatorname{sh} u)' = u' \operatorname{ch} u$ $(\operatorname{th} u)' = \dfrac{u'}{\operatorname{ch}^2 u}$

$(\coth u)' = \dfrac{-u'}{\operatorname{sh}^2 u}$ $(\operatorname{sech} u)' = \dfrac{-u' \operatorname{sh} u}{\operatorname{ch}^2 u}$ $(\operatorname{cosech} u)' = \dfrac{-u' \operatorname{ch} u}{\operatorname{sh}^2 u}$

$(\operatorname{argsh} u)' = \dfrac{u'}{\sqrt{u^2+1}}$ $(\operatorname{argch} u)' = \dfrac{u'}{\sqrt{u^2-1}}$ $(\operatorname{argth} u)' = \dfrac{u'}{1-u^2}$

$(\operatorname{argcoth} u)' = \dfrac{u'}{1-u^2}$

Algumas fórmulas trignométricas

$\cos(a \pm b) = \cos a \cos b \mp \operatorname{sen} a \operatorname{sen} b$ $\cos^2 a = \dfrac{1+\cos(2a)}{2}$

$\operatorname{sen}(a \pm b) = \operatorname{sen} a \cos b \pm \operatorname{sen} b \cos a$ $\operatorname{sen}^2 a = \dfrac{1-\cos(2a)}{2}$

$\operatorname{tg}(a \pm b) = \dfrac{\operatorname{tg} a \pm \operatorname{tg} b}{1 \mp \operatorname{tg} a \operatorname{tg} b}$ $\operatorname{tg}^2 a = \dfrac{1-\cos(2a)}{1+\cos(2a)}$

$\cos^2 a + \operatorname{sen}^2 a = 1$ $\sec a = \dfrac{1}{\cos a}$ $\operatorname{cosec} a = \dfrac{1}{\operatorname{sen} a}$

Algumas fórmulas relevantes

$$\operatorname{ch} u = \frac{e^u + e^{-u}}{2} \qquad \operatorname{sh} u = \frac{e^u - e^{-u}}{2}$$

$$\operatorname{th} u = \frac{\operatorname{sh} u}{\operatorname{ch} u} \qquad \coth u = \frac{\operatorname{ch} u}{\operatorname{sh} u}$$

$$\operatorname{ch}(u \pm v) = \operatorname{ch} u \ \operatorname{ch} v \pm \operatorname{sh} u \operatorname{sh} v \qquad \operatorname{ch}^2 u = \frac{\operatorname{ch}(2u) + 1}{2}$$

$$\operatorname{sh}(u \pm v) = \operatorname{sh} u \operatorname{ch} v \pm \operatorname{sh} v \operatorname{ch} u \qquad \operatorname{sh}^2 u = \frac{\operatorname{ch}(2u) - 1}{2}$$

$$\operatorname{th}(u \pm v) = \frac{\operatorname{th} u \pm \operatorname{th} v}{1 \pm \operatorname{th} u \operatorname{th} v} \qquad \operatorname{th}^2 u = \frac{\operatorname{ch}(2u) - 1}{\operatorname{ch}(2u) + 1}$$

$$\operatorname{ch}^2 u - \operatorname{sh}^2 u = 1 \qquad \operatorname{th}^2 u + \frac{1}{\operatorname{ch}^2 u} = 1$$

$$\operatorname{sech} u = \frac{1}{\operatorname{ch} u} \qquad \operatorname{cosech} u = \frac{1}{\operatorname{sh} u}$$