Cálculo−EC

Formulário 2013'14

Regras de derivação

($f : I \longrightarrow \mathbb{R}$ é uma função derivável num intervalo I; omitem-se os domínios das restantes funções)

$(f \circ g)' = g'\, f'(g)$	$(f^{-1})' = \dfrac{1}{f'(f^{-1})}$
$(a^x)' = a^x \ln a$	$(f^n)' = n\, f'\, f^{n-1}, \quad n \in \mathbb{R}$
$(x^x)' = x^x\,(1 + \ln x)$	$\log_a' x = \dfrac{1}{x} \log_a e$
$\operatorname{sen}' x = \cos x$	$\cos' x = -\operatorname{sen} x$
$\operatorname{tg}' x = \dfrac{1}{\cos^2 x}$	$\operatorname{cotg}' x = \dfrac{-1}{\operatorname{sen}^2 x}$
$\operatorname{sh}' x = \operatorname{ch} x$	$\operatorname{ch}' x = \operatorname{sh} x$
$\operatorname{th}' x = \dfrac{1}{\operatorname{ch}^2 x}$	$\operatorname{coth}' x = \dfrac{-1}{\operatorname{sh}^2 x}$
$\operatorname{arcsen}' x = \dfrac{1}{\sqrt{1-x^2}}$	$\operatorname{arccos}' x = \dfrac{-1}{\sqrt{1-x^2}}$
$\operatorname{arctg}' x = \dfrac{1}{1+x^2}$	$\operatorname{arccotg}' x = \dfrac{-1}{1+x^2}$
$\operatorname{argsh}' x = \dfrac{1}{\sqrt{1+x^2}}$	$\operatorname{argch}' x = \dfrac{1}{\sqrt{x^2-1}}$
$\operatorname{argth}' x = \dfrac{1}{1-x^2}$	$\operatorname{argcth}' x = \dfrac{1}{1-x^2}$

Primitivas Imediatas

($u\colon I \longrightarrow \mathbb{R}$ é uma função derivável num intervalo I e $\mathcal{C}$ denota uma constante real arbitrária)

$$\int a\,dx = ax + \mathcal{C}$$

$$\int \frac{u'}{u}\,dx = \ln|u| + \mathcal{C}$$

$$\int u' \cos u\;dx = \operatorname{sen} u + \mathcal{C}$$

$$\int \frac{u'}{\cos^2 u}\,dx = \operatorname{tg} u + \mathcal{C}$$

$$\int u' \operatorname{tg} u\;dx = -\ln|\cos u| + \mathcal{C}$$

$$\int \frac{u'}{\sqrt{1-u^2}}\,dx = \operatorname{arcsen} u + \mathcal{C}$$

$$\int \frac{u'}{1+u^2}\,dx = \operatorname{arctg} u + \mathcal{C}$$

$$\int u' \operatorname{ch} u\;dx = \operatorname{sh} u + \mathcal{C}$$

$$\int \frac{u'}{\operatorname{ch}^2 u}\,dx = \operatorname{th} u + \mathcal{C}$$

$$\int \frac{u'}{\sqrt{u^2+1}}\,dx = \operatorname{argsh} u + \mathcal{C}$$

$$\int \frac{u'}{1-u^2}\,dx = \operatorname{argth} u + \mathcal{C}$$

$$\int u'\, u^\alpha\;dx = \frac{u^{\alpha+1}}{\alpha+1} + \mathcal{C} \quad (\alpha \neq -1)$$

$$\int a^u\, u'\;dx = \frac{a^u}{\ln a} + \mathcal{C} \quad (a \in \mathbb{R}^+ \setminus \{1\})$$

$$\int u' \operatorname{sen} u\;dx = -\cos u + \mathcal{C}$$

$$\int \frac{u'}{\operatorname{sen}^2 u}\,dx = -\operatorname{cotg} u + \mathcal{C}$$

$$\int u' \operatorname{cotg} u\;dx = \ln|\operatorname{sen} u| + \mathcal{C}$$

$$\int \frac{-u'}{\sqrt{1-u^2}}\,dx = \arccos u + \mathcal{C}$$

$$\int \frac{-u'}{1+u^2}\,dx = \operatorname{arccotg} u + \mathcal{C}$$

$$\int u' \operatorname{sh} u\;dx = \operatorname{ch} u + \mathcal{C}$$

$$\int \frac{u'}{\operatorname{sh}^2 u}\,dx = -\coth u + \mathcal{C}$$

$$\int \frac{u'}{\sqrt{u^2-1}}\,dx = \operatorname{argch} u + \mathcal{C}$$

$$\int \frac{u'}{1-u^2}\,dx = \operatorname{argcth} u + \mathcal{C}$$