

Universidade de Aveiro – Departamento de Matemática
CÁLCULO I

Formulário de Derivadas

Função	Derivada	Função	Derivada
$K u \ (K \in \mathbb{R})$	$K u'$	$\ln u $	$\frac{u'}{u}$
u^r	$r u^{r-1} u'$	$\log_a u \ (a > 0 \text{ e } a \neq 1)$	$\frac{u'}{u \ln a}$
e^u	$u' e^u$	$a^u \ (a > 0 \text{ e } a \neq 1)$	$a^u \ln a u'$
$\operatorname{sen} u$	$u' \cos u$	$\cos u$	$-u' \operatorname{sen} u$
$\operatorname{tg} u$	$u' \sec^2 u$	$\operatorname{cotg} u$	$-u' \operatorname{cosec}^2 u$
$\sec u$	$\sec u \operatorname{tg} u u'$	$\operatorname{cosec} u$	$-\operatorname{cosec} u \operatorname{cotg} u u'$
$\arcsen u$	$\frac{u'}{\sqrt{1-u^2}}$	$\arccos u$	$-\frac{u'}{\sqrt{1-u^2}}$
$\arctan u$	$\frac{u'}{1+u^2}$	$\operatorname{arccotg} u$	$-\frac{u'}{1+u^2}$
$\sinh u$	$u' \cosh u$	$\cosh u$	$u' \sinh u$

Duas primitivas

Função	Primitiva	Função	Primitiva
$u' \sec u$	$\ln \sec u + \operatorname{tg} u $	$u' \operatorname{cosec} u$	$-\ln \operatorname{cosec} u + \operatorname{cotg} u $

Algumas fórmulas trigonométricas

$\sec u = \frac{1}{\cos u}$	$\cos^2 u = \frac{1 + \cos(2u)}{2}$
$\operatorname{cosec} u = \frac{1}{\operatorname{sen} u}$	$\operatorname{sen}^2 u = \frac{1 - \cos(2u)}{2}$
$1 + \operatorname{tg}^2 u = \sec^2 u$	$1 + \operatorname{cotg}^2 u = \operatorname{cosec}^2 u$
$\operatorname{cotg} u = \frac{\cos u}{\operatorname{sen} u}$	$\operatorname{sen}(u + v) = \operatorname{sen} u \cos v + \operatorname{sen} v \cos u$
$\cos(u + v) = \cos u \cos v - \operatorname{sen} u \operatorname{sen} v$	$\operatorname{sen} u \operatorname{sen} v = \frac{1}{2}(\cos(u - v) - \cos(u + v))$
$\cos u \cos v = \frac{1}{2}(\cos(u - v) + \cos(u + v))$	$\operatorname{sen} u \cos v = \frac{1}{2}(\operatorname{sen}(u - v) + \operatorname{sen}(u + v))$
$\cos^2(\operatorname{arcsen} u) = 1 - u^2$	$\operatorname{sen}^2(\arccos u) = 1 - u^2$

Algumas fórmulas hiperbólicas

$\operatorname{senh} u = \frac{e^u - e^{-u}}{2}$	$\cosh u = \frac{e^u + e^{-u}}{2}$	$\cosh^2 u - \operatorname{senh}^2 u = 1$
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Progressões aritmética e geométrica (de razão r)

Progressão	Termo geral	Soma dos n primeiros termos
Aritmética	$u_n = u_1 + (n - 1)r$	$S_n = \frac{u_1 + u_n}{2} n$
Geométrica	$u_n = u_1 r^{n-1}$	$S_n = u_1 \frac{1 - r^n}{1 - r}$ com $r \neq 1$