DERIVADAS E PRIMITIVAS DE FUNÇÕES ELEMENTARES:

Lembre-se: Sejam $I \subset \mathbb{R}$ um intervalo e $f : I \to \mathbb{R}$ uma função. A função F é uma *primitiva* de f em I, quando:

$$F'(x) = f(x), \quad x \in I.$$

Funções Elementares: exponencial, potências, logaritmo

Primitivas	Derivadas
$\int e^x dx = e^x + c, \quad x \in \mathbb{R}$	$(e^x)' = e^x, \quad x \in \mathbb{R}$
$\int x^n dx = \dfrac{x^{n+1}}{n+1} + c;\ (n \in \mathbb{N} \setminus \{-1\}), \quad x \in \mathbb{R}$	$(x^n)' = nx^{n-1},\ (n \in \mathbb{N} \setminus \{-1\}), \quad x \in \mathbb{R}$
$\int \sqrt[p]{x} dx = \dfrac{x^{1/p+1}}{1/p+1} + c;\ (p \text{ par}) \quad x \in [0, \infty)$	$(\sqrt[p]{x})' = \dfrac{1}{p} x^{p-1},\ (p \text{ par}) \quad x \in (0, \infty)$
$\int \sqrt[p]{x} dx = \dfrac{x^{1/p+1}}{1/p+1} + c;\ (p \text{ ímpar}) \quad x \in \mathbb{R}$	$(\sqrt[p]{x})' = \dfrac{1}{p} x^{p-1},\ (p \text{ ímpar}) \quad x \in \mathbb{R}$
$\int x^\alpha dx = \dfrac{x^{\alpha+1}}{\alpha+1} + c;\ (\alpha \in \mathbb{R} \setminus \mathbb{Q}) \quad x \in (0, \infty)$	$(x^\alpha)' = \alpha x^{\alpha-1} \quad x \in (0, \infty)$
$\int \dfrac{1}{x} dx = \begin{cases} \ln(x) + c, & x \in (0, \infty) \\ \ln(-x) + c, & x \in (-\infty, 0) \end{cases}$	$(\ln \lvert x \rvert)' = \dfrac{1}{x}, \quad x \in \mathbb{R} \setminus \{0\}$

Funções elementares: trigonométricas e trigonométricas inversas	
Primitivas	Derivadas
$\int \sin x dx = -\cos x + c, \quad x \in \mathbb{R}$	$(\cos x)' = -\sin x, \quad x \in \mathbb{R}$
$\int \cos x dx = \sin x + c, \quad x \in \mathbb{R}$	$(\sin x)' = \cos x, \quad x \in \mathbb{R}$
$\int \sec x \operatorname{tg} x dx \overset{*}{=} \sec x + c;$ (* em apropriados intervalos)	$(\sec x)' = \sec x \operatorname{tg} x$
$\int \sec^2 x dx \overset{*}{=} \operatorname{tg} x + c;$ (* em apropriados intervalos)	$(\operatorname{tg} x)' = \sec^2 x$
$\int \frac{1}{1+x^2} dx = \operatorname{arctg} x + c, \quad x \in \mathbb{R};$	$(\operatorname{arctg} x)' = \frac{1}{1+x^2}, \quad x \in \mathbb{R}$
$\int \frac{1}{\sqrt{1-x^2}} dx = \arcsin x + c, \quad x \in (-1, 1)$	$(\arcsin x)' = \frac{1}{\sqrt{1-x^2}}, \quad x \in (-1, 1)$
$\int \frac{1}{\sqrt{1-x^2}} dx = -\arccos x + c \quad x \in (-1, 1)$	$(\arccos x)' = \frac{-1}{\sqrt{1-x^2}}, \quad x \in (-1, 1)$
$\int \frac{1}{x\sqrt{x^2-1}} dx = \operatorname{arcsec} x + c, \quad x > 1$	$(\operatorname{arcsec} x)' = \frac{1}{x\sqrt{x^2-1}}, \quad x > 1$

$$\sin^2 x + \cos^2 x = 1; \quad \sec^2 x = \operatorname{tg}^2 x + 1;$$

$$\sin^2 x = \frac{1 - \cos 2x}{2}; \quad \cos^2 x = \frac{1 + \cos 2x}{2};$$

$$\sin(2x) = 2\sin(x)\cos(x)$$

Funções elementares: hiperbólicas e hiperbólicas inversas

Primitivas	Derivadas
$\int \frac{1}{\sqrt{1+x^2}}\,dx = senh^{-1}x + c, \quad x \in \mathbb{R}$ $senh^{-1}x = \ln\left(x+\sqrt{1+x^2}\right), \quad x \in \mathbb{R}$	$(senh^{-1}x)' = \frac{1}{\sqrt{1+x^2}}, \quad x \in \mathbb{R}$
$\int \frac{1}{\sqrt{x^2-1}}\,dx = cosh^{-1}x + c, \quad x > 1$ $cosh^{-1}x = \ln\left(x+\sqrt{x^2-1}\right), \quad x \geq 1$	$(cosh^{-1}x)' = \frac{1}{\sqrt{x^2-1}}, \quad x > 1$
$\int \frac{1}{x\sqrt{1-x^2}}\,dx = -sech^{-1}x + c, \quad 0 < x < 1$ $sech^{-1}x = \ln\left(\frac{1+\sqrt{1-x^2}}{x}\right), \quad 0 < x \leq 1$	$(sech^{-1}x)' = \frac{-1}{x\sqrt{1-x^2}}, \quad 0 < x < 1$
$\int \frac{1}{1-x^2}\,dx = tgh^{-1}x + c \qquad \lvert x\rvert < 1$ $tgh^{-1}x = \frac{1}{2}\ln\left(\frac{1+x}{1-x}\right), \quad \lvert x\rvert < 1$	$(tgh^{-1}x)' = \frac{1}{1-x^2}, \quad \lvert x\rvert < 1$
$\int \frac{1}{1-x^2}\,dx = cotgh^{-1}x + c, \qquad \lvert x\rvert > 1$ $cotgh^{-1}x = \frac{1}{2}\ln\left(\frac{1+x}{x-1}\right) \qquad \lvert x\rvert > 1$	$(cotgh^{-1}x)' = \frac{1}{1-x^2}, \quad \lvert x\rvert > 1$