

CM201 - Cálculo Diferencial e Integral I  
Tabela de derivadas, somas e integrais

*Derivadas:*

$$(x^r)' = rx^{r-1}$$

$$[\text{sen}(x)]' = \text{cos}(x)$$

$$[\text{cos}(x)]' = -\text{sen}(x)$$

$$[\text{tg}(x)]' = \text{sec}^2(x)$$

$$[\text{sec}(x)]' = \text{sec}(x)\text{tg}(x)$$

$$(e^x)' = e^x$$

$$[\ln(x)]' = 1/x$$

$$(a^x)' = a^x \ln(a), \quad a > 0$$

$$[\log_a(x)]' = \frac{1}{x \ln(a)}, \quad a > 0, x \neq 0$$

$$[\arcsen(x)]' = \frac{1}{\sqrt{1-x^2}}, \quad |x| < 1$$

$$[\text{arctg}(x)]' = \frac{1}{1+x^2}$$

$$(f(x)g(x))' = f'(x)g(x) + f(x)g'(x)$$

$$\left(\frac{f(x)}{g(x)}\right)' = \frac{f'(x)g(x) - f(x)g'(x)}{g(x)^2}, \quad g(x) \neq 0$$

$$[f(g(x))]' = f'(g(x))g'(x)$$

*Somas:*

$$\sum_{k=1}^n k = \frac{n(n+1)}{2}$$

$$\sum_{k=1}^n k^2 = \frac{n(n+1)(2n+1)}{6}$$

$$\sum_{k=0}^n r^k = \frac{1-r^{n+1}}{1-r}, \quad r \neq 1$$

*Integrais:*

$$\int x^k dx = \frac{x^{k+1}}{k+1} + C, \quad k \neq -1$$

$$\int \frac{1}{x} dx = \ln(x) + C, \quad x > 0$$

$$\int e^x dx = e^x + C$$

$$\int a^x dx = \frac{a^x}{\ln(a)} + C, \quad a > 0, a \neq 1$$

$$\int \text{sen}(x) dx = -\text{cos}(x) + C$$

$$\int \text{cos}(x) dx = \text{sen}(x) + C$$

$$\int \frac{1}{\sqrt{a^2-x^2}} dx = \arcsen\left(\frac{x}{a}\right) + C, \quad |x| < a, a \neq 0$$

$$\int \frac{1}{a^2+x^2} dx = \arctan\left(\frac{x}{a}\right) + C, \quad a \neq 0$$

$$\int_a^b f(x+k) dx = \int_{a+k}^{b+k} f(x) dx$$

$$\int_a^b f(kx) dx = \frac{1}{k} \int_{ka}^{kb} f(x) dx$$

$$\int_a^b f(g(x))g'(x) dx = \int_{g(a)}^{g(b)} f(x) dx$$

$$\int_a^b u(x)v'(x) dx = [u(x)v(x)]_a^b - \int_a^b u'(x)v(x) dx$$