| Derivadas | |
|---|---|
| $f(x)$ | $f'(x)$ |
| $x^n$ | $nx^{n-1}$ |
| $\ln(x)$ | $\dfrac{1}{x}$ |
| $e^x$ | $e^x$ |
| $f(x) + g(x)$ | $f'(x) + g'(x)$ |
| $f(x) - g(x)$ | $f'(x) - g'(x)$ |
| $f(x) \cdot g(x)$ | $f'(x) \cdot g(x) + f(x) \cdot g'(x)$ |
| $\dfrac{f(x)}{g(x)}$ | $\dfrac{f'(x) \cdot g(x) - f(x) \cdot g'(x)}{(g(x))^2}$ |
| $f(g(x))$ (regla de la cadena) | $f'(g(x)) \cdot g'(x)$ |

## PROPIEDADES DE LA SUMATORIA:

1) $\displaystyle\sum_{i=1}^{n} a \times x_i = a \times x_1 + a \times x_2 + \ldots + a \times x_n = a \times \sum_{i=1}^{n} x_i$

2) $\displaystyle\sum_{i=1}^{n} a = a + a + \ldots + a = a \times \sum_{i=1}^{n} 1 = a \times n$

## PROPIEDADES DE LA PRODUCTORIA:

1. $\displaystyle\prod_{i=1}^{n} (a \times x_i) = (a \times x_1) \times (a \times x_2) \times \ldots \times (a \times x_n) = a^n \times \prod_{i=1}^{n} x_i$

2. $\displaystyle\prod_{i=1}^{n} a^{x_i} = a^{x_1} \times a^{x_2} \times \ldots \times a^{x_n} = a^{\sum_{i=1}^{n} x_i}$

## PROPIEDADES DEL LOGARITMO NATURAL:

1. $\ln(a \times b) = \ln(a) + \ln(b)$
2. $\ln(a/b) = \ln(a) - \ln(b)$
3. $\ln(a^b) = b \times \ln(a)$

4. $\ln(1) = 0$
5. $\ln(e) = 1$

Observar que:

$$\ln\left(\prod_{i=1}^{n} x_i\right) = \ln(x_1 \times x_2 \times \ldots \times x_n) = \ln(x_1) + \ln(x_2) + \ldots + \ln(x_n) = \sum_{i=1}^{n} \ln(x_i)$$

$$\ln\left(\prod_{i=1}^{n} a^{x_i}\right) = \ln\left(a^{\sum_{i=1}^{n} x_i}\right) = \left(\sum_{i=1}^{n} x_i\right) \times \ln(a) = \ln(a) \times \sum_{i=1}^{n} x_i$$