DER-A1-002-*Testo*

Calcolare la DERIVATA della seguente funzione:

$$y = \frac{\log x \sin x + 3x^2}{\sqrt[3]{x^2} + 3}$$

DER-A1-002-*Procedimento*

$$y' = \frac{D\left[\log x \sin x + 3x^2\right] \cdot \left(\sqrt[3]{x^2} + 3\right) - D\left[\sqrt[3]{x^2} + 3\right] \cdot \left(\log x \sin x + 3x^2\right)}{\left(\sqrt[3]{x^2} + 3\right)^2}$$

$$y' = \frac{D\left[\log x \sin x + 3x^2\right] \ldots\ldots\ldots\ldots\ldots\ldots D\left[\sqrt[3]{x^2} + 3\right] \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots}{\ldots\ldots\ldots\ldots\ldots}$$

$$y' = \frac{\left\{D\left[\log x \sin x\right] + D\left[3x^2\right]\right\} \ldots\ldots\ldots \left\{D\left[\sqrt[3]{x^2}\right] + D\left[3\right]\right\} \ldots\ldots\ldots\ldots\ldots}{\ldots\ldots\ldots\ldots\ldots}$$

$$y' = \frac{\left\{D\left[\log x\right](\sin x) + D\left[\sin x\right](\log x) + 3D\left[x^2\right]\right\} \ldots\ldots\ldots \left\{D\left[x^{\frac{2}{3}}\right] + D\left[3\right]\right\} \ldots\ldots}{\ldots\ldots\ldots\ldots\ldots}$$

$$y' = \frac{\left\{\left(\frac{1}{x}\right)(\sin x) + (\cos x)(\log x) + 3(2x)\right\} \ldots\ldots\ldots \left\{\left(\frac{2}{3} x^{\frac{2}{3}-1}\right) + (0)\right\} \ldots\ldots\ldots\ldots\ldots}{\ldots\ldots\ldots\ldots\ldots}$$

$$y' = \frac{\left(\frac{\sin x}{x} + \cos x \log x + 6x\right) \ldots\ldots\ldots \left(\frac{2}{3} x^{-\frac{1}{3}}\right) \ldots\ldots\ldots\ldots\ldots}{\ldots\ldots\ldots\ldots\ldots}$$

DER-A1-002-*Soluzione*

$$y' = \frac{\left(\frac{\sin x}{x} + \cos x \log x + 6x\right)\left(\sqrt[3]{x^2} + 3\right) - \left(\frac{2}{3\sqrt[3]{x}}\right)\left(\log x \sin x + 3x^2\right)}{\left(\sqrt[3]{x^2} + 3\right)^2}$$

DER-A1-002-***Note***

TIPI:

$$y = \frac{f(x)}{g(x)} \quad \rightarrow \quad y' = \frac{f'(x) \cdot g(x) - f(x) \cdot g'(x)}{\left[g(x)\right]^2}$$

$$y = f(x) \cdot g(x) \quad \rightarrow \quad y' = f'(x) \cdot g(x) + f(x) \cdot g'(x)$$

$$y = f(x) + g(x) \quad \rightarrow \quad y' = f'(x) + g'(x)$$

$$y = \mathrm{k} \cdot f(x) \quad \rightarrow \quad y' = \mathrm{k} \cdot f'(x)$$

FORMULE :

$$y = \sin x \quad \rightarrow \quad y' = \cos x$$

$$y = x^{\alpha} \quad \rightarrow \quad y' = \alpha x^{\alpha - 1}$$

$$y = \log x \quad \rightarrow \quad y' = \frac{1}{x}$$

NOTA: $D[.....]$ significa "derivata di quel che c'è tra parentesi quadre"