

DERIVATA DELLA POTENZA CON ESPONENTE NATURALE.

$$D \left[(f(x))^n \right] = n \cdot f(x)^{n-1} \cdot f'(x)$$

$$n=3 \quad \left(\begin{array}{c} F(x) \\ y = f(x) \cdot f(x) \cdot f(x) \end{array} \right)$$

$$\begin{aligned} y' &= f'(x) (f(x))^2 + f(x) D(f^2(x)) = \\ &= f'(x) (f(x))^2 + f(x) [f'(x) f(x) + f(x) f'(x)] = \\ &= f'(x) (f(x))^2 + f(x) [2 f(x) f'(x)] = \\ &= f'(x) (f(x))^2 + 2 (f(x))^2 f'(x) = \\ &= 3 f'(x) (f(x))^2 \end{aligned}$$

ESEMPIO

$$\begin{aligned} \bullet \quad y &= \operatorname{sen}^3 x & f(x) &= \operatorname{sen} x & f'(x) &= \cos x \\ D(\operatorname{sen}^3 x) &= D \left[(f(x))^3 \right] = 3 f(x)^{3-1} f'(x) = \\ &= 3 \operatorname{sen}^2 x \cos x \end{aligned}$$

$$y' = 3 \operatorname{sen}^2 x (\cos x)$$