



Ejercicio 13

13 Calcula la derivada de estas funciones:

a) $y = \text{sen } x \cos^2 x$

b) $y = \frac{\text{sen}^2 x}{1 + \cos^2 x}$

c) $y = \text{sen}^2 x^2$

d) $y = \cos^3 (2x + 1)$

Resolución

$$\begin{aligned} \text{a) } y' &= \cos x \cos^2 x - 2\cos x \text{sen } x \text{sen } x = \cos^3 x - 2\text{sen}^2 x \cos x = \\ &= \cos^3 x - 2(1 - \cos^2 x) \cos x = \cos^3 x - 2\cos x + 2\cos^3 x = 3\cos^3 x - 2\cos x \end{aligned}$$

$$\begin{aligned} \text{b) } y' &= \frac{2\text{sen } x \cos x(1 + \cos^2 x) + 2\cos x \text{sen } x \text{sen}^2 x}{(1 + \cos^2 x)^2} = \frac{2\text{sen } x \cos x + 2\text{sen } x \cos^3 x + 2\cos x \text{sen}^3 x}{(1 + \cos^2 x)^2} = \\ &= \frac{2\text{sen } x \cos x(1 + \cos^2 x + \text{sen}^2 x)}{(1 + \cos^2 x)^2} = \frac{4\text{sen } x \cos x}{(1 + \cos^2 x)^2} \end{aligned}$$

$$\text{c) } y' = 2x \cdot 2\text{sen } x^2 \cdot \cos x^2 = 4x \text{sen } x^2 \cos x^2$$

$$\text{d) } y' = 3\cos^2 (2x + 1) \cdot [-\text{sen } (2x + 1) \cdot 2] = -6\text{sen } (2x + 1) \cos^2 (2x + 1)$$