



Ejercicio 15

15 Halla la derivada de:

a) $y = \sqrt{x} \sqrt{x}$

b) $y = \ln \sqrt{\frac{x}{x+1}}$

c) $y = \ln(\operatorname{sen} \sqrt{e^x})$

d) $y = \sqrt{\frac{x-1}{x+1}}$

• b) *Aplica las propiedades de los logaritmos antes de derivar.*

Resolución

a) $y = \sqrt{\sqrt{x^2 \cdot x}} = \sqrt[4]{x^3} = x^{3/4} \rightarrow y' = \frac{3}{4} \cdot x^{-1/4} = \frac{3}{4 \cdot \sqrt[4]{x}}$

b) $y = \frac{1}{2} \cdot (\ln x - \ln(x+1))$

$$y' = \frac{1}{2} \cdot \left(\frac{1}{x} - \frac{1}{x+1} \right) = \frac{1}{2x^2 + 2x}$$

c) $y = \ln(\operatorname{sen} e^{x/2}) \rightarrow y' = \frac{(1/2) \cdot e^{x/2} \cdot \cos e^{x/2}}{\operatorname{sen} e^{x/2}} = \frac{e^{x/2} \cdot \cos \sqrt{e^x}}{2 \cdot \operatorname{sen} \sqrt{e^x}}$

$$d) y' = \frac{\frac{x+1-x+1}{(x+1)^2}}{2 \cdot \sqrt{\frac{x-1}{x+1}}} = \frac{1}{(x+1)^2 \cdot \sqrt{\frac{x-1}{x+1}}} = \frac{1}{\sqrt{(x+1)^4 \cdot \frac{x-1}{x+1}}} = \frac{1}{\sqrt{(x-1) \cdot (x+1)^3}}$$