

Regla de la cadena

1. $f(x) = \cos 3^x$

$$f'(x) = -3^x \ln 3 \operatorname{sen} 3^x$$

2. $f(x) = \operatorname{tg}(\ln x)$

$$f'(x) = \frac{1}{\cos^2(\ln x)} \cdot \frac{1}{x} =$$

$$= \frac{1}{x \cos^2(\ln x)} = \frac{1}{x} \sec^2(\ln x) = \frac{1}{x} (1 + \operatorname{tg}^2 \ln x)$$

3. $f(x) = \operatorname{sen}(\operatorname{sen} x)$

$$f'(x) = \cos(\operatorname{sen} x) \cdot \cos x$$

4. $f(x) = \operatorname{sen} \sqrt{\ln(1-3x)}$

$$f'(x) = \cos \sqrt{\ln(1-3x)} \cdot \frac{1}{2\sqrt{\ln(1-3x)}} \cdot \frac{1}{(1-3x)} \cdot (-3)$$

5. $f(x) = \operatorname{arc} \cotg(\ln x)$

$$f'(x) = -\frac{1}{1+\ln^2 x} \cdot \frac{1}{x} = -\frac{1}{x(1+\ln^2 x)}$$