

Calcule a derivada das funções abaixo:

Respostas:

$$1. y = (x^5 - 10x^2 + 2)^3$$

$$f'(x) = \frac{df}{dx} = 3(x^5 - 10x^2 + 2)^2 (5x^4 - 20x)$$

$$2. f(x) = \sqrt{x^2 + 4}$$

$$f'(x) = \frac{df}{dx} = \frac{x}{\sqrt{x^2 + 4}}$$

$$3. f(x) = \ln(x^2 + 10)$$

$$f'(x) = \frac{df}{dx} = \frac{2x}{x^2 + 10}$$

$$4. f(\theta) = \ln(\cos(\theta))$$

$$f'(\theta) = \frac{df}{d\theta} = -\frac{\sin(\theta)}{\cos(\theta)}$$

$$5. g(x) = \cos(\ln(x))$$

$$g'(x) = \frac{df}{dx} = -\frac{\sin(\ln(x))}{x}$$

$$6. y = \log_2(1 - 3t)$$

$$y' = \frac{dy}{dx} = -\frac{3}{(1 - 3t) \ln(2)}$$

$$7. y = \log_{10}\left(\frac{w}{w-1}\right)$$

$$y' = \frac{dy}{dw} = -\frac{1}{(w-1)w(\ln(2) + \ln(5))}$$

$$8. w = \sqrt[5]{\ln(x)}$$

$$w' = \frac{dw}{dx} = \frac{1}{5 \ln(x)^{4/5} x}$$

$$9. f(u) = \ln(\sqrt[5]{u})$$

$$f' = \frac{df}{du} = \frac{1}{5u}$$

$$10. t = \sqrt{w} \cdot \ln(w)$$

$$t' = \frac{dt}{dw} = \frac{1}{2} \frac{\ln(w)}{\sqrt{w}} + \frac{1}{\sqrt{w}}$$

$$11. f(t) = \frac{1 + \ln(t)}{1 - \ln t}$$

$$f' = \frac{df}{dt} = \frac{2}{(-1 + \ln(t))^2 t}$$

$$12. w = \ln\left(\frac{(2t+1)^3}{(3t-1)^4}\right)$$

$$w' = \frac{dw}{dt} = -\frac{6(t+3)}{(2t+1)(3t-1)}$$

$$13. y = \ln(e^{-x} + x \cdot e^{-x})$$

$$y' = -\frac{x}{1+x}$$

$$14. G(x) = e^{x^2} \cdot \sin(x+1)$$

$$G' = \frac{dG}{dx} = 2x e^{x^2} \sin(x+1) + e^{x^2} \cos(x+1)$$

$$15. w = \frac{e^{(t+1)}}{t^3 - 2t}$$

$$w' = \frac{dw}{dt} = \frac{e^{t+1}}{t^3 - 2t} - \frac{e^{t+1}(3t^2 - 2)}{(t^3 - 2t)^2}$$