

DICAS - LISTA 2 - 2º BIM.

2.4) $g(\pi) = (2\pi^4 + 8\pi^2 + 1)^5$

(*) $g(\pi) = p(q(\pi)) \Rightarrow g'(\pi) = p'(q(\pi)) \cdot q'(\pi)$
ONDE:

i) $p(\pi) = \pi^5 \Rightarrow p'(\pi) = 5\pi^4$

ii) $q(\pi) = 2\pi^4 + 8\pi^2 + 1 \Rightarrow q'(\pi) = 8\pi^3 + 16\pi$

SUBSTITUINDO i) E ii) EM (*):

$$g'(\pi) = 5(2\pi^4 + 8\pi^2 + 1)^4 (8\pi^3 + 16\pi)$$

$$g'(\pi) = (40\pi^3 + 80\pi)(2\pi^4 + 8\pi^2 + 1)$$

$$\text{ou, } g'(\pi) = 40(\pi^3 + 2\pi)(2\pi^4 + 8\pi^2 + 1)$$

2.5) $f(x) = \ln(\sqrt{5x-3})$

(*) $f(x) = l(\pi(p(x)))$

$$f'(x) = l'(\pi(p(x))) \cdot \pi'(p(x)) \cdot p'(x)$$

ONDE:

i) $l(x) = \ln(x) \Rightarrow l'(x) = 1/x$

ii) $\pi(x) = \sqrt{x} \Rightarrow \pi'(x) = \frac{1}{2\sqrt{x}}$

iii) $p(x) = 5x-3 \Rightarrow p'(x) = 5$

SUBST. i), ii) E iii) EM (*):

$$f'(x) = \frac{1}{\sqrt{5x-3}} \cdot \frac{1}{2\sqrt{5x-3}} \cdot 5$$

$$f'(x) = \frac{5}{2(5x-3)} \Rightarrow f'(x) = \frac{5}{10x-6}$$

3.9) $g(x) = \sec(x^2) - \csc(3x+2)$

$$g'(x) = \sec(x^2) \cdot \operatorname{tg}(x^2) \cdot (2x) - (-\csc(3x+2) \cdot \cotg(3x+2))$$

$$g'(x) = 2x \sec(x^2) \cdot \operatorname{tg}(x^2) + \csc(3x+2) \cdot \cotg(3x+2)$$

CÁLCULO I

PROF.: PAULO A.

ENG. DE ALIM

UFT/ PALMAS/TO

3.f) $h(x) = \tan(2x) \cdot \cos(3x)$

(i) $h(x) = t(x) \cdot c(x)$

$$h'(x) = t'(x) \cdot c(x) + t(x) \cdot c'(x)$$

ONDE:

a) $t(x) = \tan(2x) \Rightarrow t'(x) = \sec^2(2x) \cdot 2$

$$t'(x) = 2 \sec^2(2x)$$

b) $c(x) = \cos(3x) \Rightarrow c'(x) = -\sin(3x) \cdot 3$

$$c'(x) = -3 \sin(3x)$$

SUBST. a) E b) EM (i):

$$h'(x) = 2 \sec^2(2x) \cdot \tan(2x) + \tan(2x) \cdot (-3 \sin(3x))$$

$$h'(x) = \tan(2x) \cdot (2 \sec^2(2x) - 3 \sin(3x))$$

4.c) $f(x) = \sin(2x) + \frac{1}{6} x^3$

$$f'(x) = \cos(2x) \cdot 2 + \frac{3}{6} x^2 = 2 \cos(2x) + \frac{1}{2} x^2$$

$$f''(x) = 2 \cdot (-\sin(2x) \cdot 2) + \frac{2}{2} x = -4 \sin(2x) + x$$

$$f'''(x) = -4 \cos(2x) \cdot 2 + 1 = -8 \cos(2x) + 1$$

$$f^{IV}(x) = -8 (-2 \sin(2x)) + 0 = 16 \sin(2x)$$