

Hallar las derivadas sucesivas de:

1 $f(x) = 3x^4 + 5x^2 + 2x - 5$

$$f'(x) = 12x^3 + 10x^2 + 2$$

$$f''(x) = 36x^2 + 20x$$

$$f'''(x) = 72x + 20$$

$$f^{IV}(x) = 72$$

$$f^V(x) = 0$$

3 $f(x) = \text{sen } x$

$$f'(x) = \cos x = \text{sen}\left(\frac{\pi}{2} + x\right)$$

$$f''(x) = -\text{sen } x = -[-\text{sen}(\pi + x)] = \text{sen}\left(2 \cdot \frac{\pi}{2} + x\right)$$

$$f'''(x) = -\cos x = -\text{sen}\left(\frac{\pi}{2} + x\right) = -[-\text{sen}\left(3 \cdot \frac{\pi}{2} + x\right)] = \text{sen}\left(3 \cdot \frac{\pi}{2} + x\right) \quad \dots$$

$$f^n(x) = \text{sen}\left(\frac{n \cdot \pi}{2} + x\right)$$

3 $f(x) = e^{-3x}$

$$f'(x) = -3 \cdot e^{-3x}$$

$$f''(x) = 9 \cdot e^{-3x}$$

$$f'''(x) = -27 \cdot e^{-3x}$$

...

$$f^n(x) = (-3)^n \cdot e^{-3x}$$

2 $f(x) = \ln x$

$$f'(x) = \frac{1}{x}$$

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

$$f'''(x) = \frac{2}{x^3}$$

$$f^{IV}(x) = \frac{-2 \cdot 3}{x^4} \quad \dots$$

$$f^n(x) = (-1)^{n-1} \frac{(n-1)!}{x^n}$$