TITULO Solución Recup. N°

FECHA / /

①

$$f(x) = \frac{5x-2}{4x^2-1} \begin{cases} u \\ v \end{cases} \quad f'(x) = \frac{u'v - uv'}{v^2}$$

$$f'(x) = \frac{(5x-2)'(4x^2-1) - (5x-2)(4x^2-1)'}{(4x^2-1)^2}$$

$$f'(x) = \frac{5(4x^2-1) - (5x-2)(8x)}{(4x^2-1)^2}$$

$$f'(x) = \frac{20x^2 - 5 - 40x^2 + 16x}{(4x^2-1)^2} = \frac{-20x^2+16x-5}{(4x^2-1)^2}$$

$$f'(x) = \frac{-20x^2+16x-5}{16x^4-8x^2+1}$$

②

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

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

$$f'(x) = (-1)x^{-2} + 2\frac{1}{x} - \left[(x^{-1})'\ln x + (x^{-1})(\ln x)'\right]$$

$$f'(x) = -x^{-2} + \frac{2}{x} - \left[(-1)x^{-2}\ln x + x^{-1}\left(\frac{1}{x}\right)\right]$$

$$f'(x) = -\frac{1}{x^2} + \frac{2}{x} - \left[-\frac{\ln x}{x^2} + \frac{1}{x^2}\right]$$

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

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

ó $$f'(x) = \frac{2x-2+\ln x}{x^2}$$

TITULO Solución Recup. N° FECHA / /

(3) $$f(x) = \operatorname{sen}\left(\frac{x+1}{2x-3}\right)$$

$$f'(x) = \cos\left(\frac{x+1}{2x-3}\right) \cdot \left(\frac{x+1}{2x-3}\right)'$$

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

$$f'(x) = \frac{(1)(2x-3)-(x+1)(2)}{(2x-3)^2} \cos\left(\frac{x+1}{2x-3}\right)$$

$$f'(x) = \frac{2x-3-2x-2}{(2x-3)^2} \cos\left(\frac{x+1}{2x-3}\right)$$

$$f'(x) = -\frac{5}{(2x-3)^2} \cos\left(\frac{x+1}{2x-3}\right)$$

(4) Determine los puntos de tangente horizontal de la función: $f(x) = \frac{x^3}{x+2}$

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

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

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

$$f'(x) = \frac{2x^3+6x^2}{(x+2)^2} = \frac{2x^2(x+3)}{(x+2)^2} = 0$$

solución: $2x^2 = 0$ ó $x+3=0$

puntos cuando: $\boxed{x=0}$ * $\boxed{x=-3}$ *