MATEMÁTICAS

2º BACHILLERATO
TEMA 3: Derivadas

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DERIVADAS

1) Calcula las funciones derivadas y simplifica cuando se pueda:

a) $f(x) = -x^7 + \frac{3}{4}x - 1$ (Sol: $f'(x) = -7x^6 + \frac{3}{4}$)

b) $y = (x^2 + 2x)^3$ $(\text{Sol}: y' = 6x^5 + 30x^4 + 48x^3 + 24x^2)$

c) $f(x) = = e^{7x^4 - 3}$ (Sol: $f'(x) = 28x^3 \cdot e^{7x^4-3}$)

d) $y = \frac{x^2}{x^2 + 1}$ $\left(\text{Sol}: y' = \frac{2x}{(x^2+1)^2}\right)$

e) $y = \frac{e^x + 1}{e^x - 1}$ $\left(\text{Sol}: \quad y' = \frac{-2e^x}{(e^x - 1)^2}\right)$

f) $y = \cos x^4$ (Sol: $y' = -\text{sen}\ x^4 \cdot 4x^3$)

g) $y = \text{sen}^3 x$; (Sol: $y' = 3 \cdot \text{sen}^2 x \cdot \cos x$)

h) $y = \sqrt{4x^3 + 1}$ (Sol: $y' = \frac{6x^2}{\sqrt{4x^3+1}}$)

i) $y = \ln(3x^4 - 2x)$ (Sol: $y' = \frac{12x^3 - 2}{3x^4 - 2x}$)

j) $y = e^{7x} \cdot \text{sen}^3 x$ (Sol: $y' = e^{7x} \cdot (7 \cdot \text{sen}^3 x + 3 \cdot \text{sen}^2 x \cdot \cos x)$)

k) $y = (4x^2 - 2)\sqrt{4x - 2}$ (Sol: $y' = \frac{40x^2 - 16x - 4}{\sqrt{4x-2}}$)

l) $y = \text{sen}\left(\frac{x+1}{2x-3}\right)$ (Sol: $y' = \frac{-5}{(2x-3)^2} \cdot \cos\left(\frac{x+1}{2x-3}\right)$)

m) $y = \ln(x^2 + 3x)^3$ (Sol: $y' = \frac{3(2x+3)}{x^2+3x}$)

n) $y = \ln\left(\frac{xe^x}{1+e^x}\right)$ $\left(\text{Sol}: \quad y' = \frac{1 + x + e^x}{x(1+e^x)}\right)$

o) $y = (\cos x)^{x^2+5}$ $\left(\text{Sol}: y' = (\cos x)^{x^2+5} \cdot (2x \cdot \ln(\cos x) - (x^2 + 5) \cdot \text{tag}\ x\right)$