This is wrong!!

$y' = (2x)(3x^2 - 1)$

$y' = 6x^3 - 2x$

Using Algebra and the Product Rule to take a derivative

Algebra then Calculus

J) $y = (x^2 + 3)(x^3 - x)$

$y = (x^2+3)(x^3-x)$

$y = x^5 - x^3 + 3x^3 - 3x$

$y = x^5 + 2x^3 - 3x$

$\frac{dy}{dx} = 5x^4 + 6x^2 - 3$

Calculus then Algebra

J) $y = (x^2 + 3)(x^3 - x)$

$\frac{dy}{dx} = (x^2+3)(3x^2-1) + (x^3-x)(2x)$

$\frac{dy}{dx} = 3x^4 - x^2 + 9x^2 - 3 + 2x^4 - 2x^2$

$\frac{dy}{dx} = 5x^4 + 6x^2 - 3$

Using Algebra and the Quotient Rule to take a derivative

K) $f(x) = \frac{x^3+9}{x}$

$f(x) = \frac{x^3+9}{x}$

$f(x) = \frac{x^3}{x} + \frac{9}{x}$

$f(x) = x^2 + 9x^{-1}$

$f'(x) = 2x - 9x^{-2}$

K) $f(x) = \frac{x^3+9}{x}$

$f(x) = \frac{x^3+9}{x}$

$f(x) = (x^3+9) \cdot \frac{1}{x}$

$f(x) = (x^3+9)(x^{-1})$

$f(x) = x^2 + 9x^{-1}$

$f'(x) = 2x - 9x^{-2}$

$f'(x) = \frac{x(3x^2) - (x^3+9)(1)}{(x)^2}$

$f'(x) = \frac{3x^3 - x^3 - 9}{x^2}$

$f'(x) = \frac{2x^3 - 9}{x^2}$

$f'(x) = \frac{2x^3}{x^2} - \frac{9}{x^2} = 2x - 9x^{-2}$

Take the Derivative of the function

L) $y = (x^2 + x + 2)(x^5 + x^3 + 5x)$

$y = (x^2+x+2)(x^5+x^3+5x)$

$\frac{dy}{dx} = (x^2+x+2)(5x^4+3x^2+5) + (x^5+x^3+5)(2x+1)$

$y = x^7 + x^5 + 5x^3 + x^6 + x^4 + 5x^2 + 2x^5 + 2x^3 + 10x$

$y = x^7 + x^6 + 3x^5 + x^4 + 7x^3 + 5x^2 + 10x$

$\frac{dy}{dx} = 7x^6 + 6x^5 + 15x^4 + 4x^3 + 21x^2 + 10x + 10$

Take the Derivative of the function

M) $f(x)=\dfrac{x^4}{2-x^2}$

$f(x)=\dfrac{x^4}{2-x^2}$

$f'(x)=\dfrac{(2-x^2)(4x^3)-x^4(-2x)}{(2-x^2)^2}$

$f'(x)=\dfrac{8x^3-4x^5+2x^5}{(2-x^2)^2}$

$f'(x)=\dfrac{-2x^5+8x^3}{(2-x^2)^2}$

N) $f(x)=(5-x^2)(3-x)^{-1}$

$f(x)=(5-x^2)(3-x)^{-1}$

$f(x)=\dfrac{(5-x^2)}{(3-x)}$

Quotient Rule

O) $f(x)=\dfrac{(x+3)(x-4)}{(x+1)(x-3)}$

$f(x)=\dfrac{(x+3)(x-4)}{(x+1)(x-3)}$

$f(x)=\dfrac{x^2-1x-12}{x^2-2x-3}$

Quotient Rule

P) $f(x)=\dfrac{\sqrt[3]{x}+1}{\sqrt[3]{x}-1}=\dfrac{x^{1/3}+1}{x^{1/3}-1}$

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

Algebra $=\frac{1}{3}x^{-1/3}-\frac{1}{3}x^{-2/3}-\frac{1}{3}x^{-1/3}-\frac{1}{3}x^{-2/3}$

$=\dfrac{-\frac{2}{3}x^{-2/3}}{(x^{1/3}-1)^2}=\dfrac{\left(\frac{-2}{3x^{2/3}}\right)}{\left(\frac{(x^{1/3}-1)^2}{1}\right)}=\dfrac{-2}{3x^{2/3}(x^{1/3}-1)^2}$

$\dfrac{-2}{3\sqrt[3]{x^2}(\sqrt[3]{x}-1)^2}$

$\frac{1}{3}-1=\frac{1}{3}-\frac{3}{3}=\frac{-2}{3}$