Function derivative example

Calculate the derivative of the following function:

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

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

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

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

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

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

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