CALCULUS
Chain Rule problems
OLD2
0380-1. Write \( \tan(x^3) \) as a composite \( f(g(x)) \). State explicitly what the function \( f \) is, and what the expression \( g(x) \) is.

0380-2. Compute \( \frac{d}{dx} \left[ \tan(x^3) \right] \).

0380-3. Write \( \tan^3 x \) as a composite \( f(g(x)) \). State explicitly what the function \( f \) is, and what the expression \( g(x) \) is.

0380-4. Compute \( \frac{d}{dx} \left[ \tan^3 x \right] \).
0380-5. Compute \( \frac{d}{dx} \left[ (x^4 - 7x^2 + 5)^{250} \right] \). 

0380-6. Compute \( \frac{d}{dx} \left[ \sqrt[3]{x^5 - 4x^2 + 5} \right] \). 

0380-7. Compute \( \frac{d}{dx} \left[ (3x - 2)^{510}(-3x + 4)^{50} \right] \). 

0380-8. Compute \( \frac{d}{dx} \left[ \sin \left( 4x^{25} - 2x^{12} + 8 \right) \right] \).
0380-9. Compute \( \frac{d}{dx} \left[ (e^{2x-5}) \right] \). 

0380-10. Compute \( \frac{d}{dx} \left[ e^{\csc(\pi x)} \right] \).

0380-11. Compute \( \frac{d}{dx} \left[ \sin \left( \sec^2 \left( x^6 \right) \right) \right] \).

0380-12. Compute \( \frac{d}{dx} \left[ \cot \left( \sqrt[5]{\sin \left( \cos \left( x^3 + 1 \right) \right)} \right) \right] \).
0380-13. Suppose \( f(1) = 3, \ f'(1) = 4, \)
\( g(3) = 5 \) and \( g'(3) = 6. \)
Let \( h(x) = g(f(x)) \).

a. Compute \( h(1) \).

b. Compute \( h'(1) \).

0380-14. Let \( f : \mathbb{R} \to \mathbb{R} \) be a differentiable function.

a. Compute \( \frac{d}{dx} \left[ \tan \left( f(x) \right) \right] \).

b. Compute \( \frac{d}{dx} \left[ f \left( \tan x \right) \right] \).

c. Compute \( \frac{d}{dx} \left[ f \left( e^{2x} \right) \right] \).

d. Compute \( \frac{d}{dx} \left[ e^{2[f(x)]]} \right] \).