

CALCULUS
Chain Rule problems
OLD

0380-1. Write $\sin(x^2)$ as a composite $f(g(x))$.
State explicitly what the function f is,
and what the expression $g(x)$ is.

0380-2. Compute $\frac{d}{dx} [\sin(x^2)]$.

0380-3. Write $\sin^2 x$ as a composite $f(g(x))$.
State explicitly what the function f is,
and what the expression $g(x)$ is.

0380-4. Compute $\frac{d}{dx} [\sin^2 x]$.

0380-5. Compute $\frac{d}{dx} \left[(x^3 + 2x + 5)^{1000} \right]$.

0380-6. Compute $\frac{d}{dx} \left[\sqrt[7]{x^3 - x^2 - 4x - 2} \right]$.

0380-7. Compute $\frac{d}{dx} \left[(2x + 3)^{500} (4x + 5)^{750} \right]$.

0380-8. Compute $\frac{d}{dx} \left[\cos \left(4x^{1000} - 2x - 2 \right) \right]$.

0380-9. Compute $\frac{d}{dx} \left[e^{2x(\sec x)} \right]$.

0380-10. Compute $\frac{d}{dx} \left[e^{\tan(2\pi x)} \right]$.

0380-11. Compute $\frac{d}{dx} \left[\sec \left(\sin^2 \left(x^3 \right) \right) \right]$.

0380-12. Compute $\frac{d}{dx} \left[\tan \left(\sqrt[3]{\cos \left(\sin \left(x^2 \right) \right)} \right) \right]$.

0380-13. Suppose $f(1) = 2$, $f'(1) = 3$,
OLD $g(2) = 4$ and $g'(2) = 5$.

Let $h(x) = g(f(x))$.

- a. Compute $h(1)$. b. Compute $h'(1)$.

0380-14. Let $f : \mathbb{R} \rightarrow \mathbb{R}$ be a differentiable
OLD function.

a. Compute $\frac{d}{dx} [\cos (f(x))]$.

b. Compute $\frac{d}{dx} [f (\cos x)]$.

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

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