Extra Credit Assignment 3

Due Friday, September 11, 11:59 PM

(I) Why do you think the chain rule should be true?

(II) Can you think of at least one physical example where the chain rule makes total sense to you? (This may help with exploring the previous part of the problem.) I want you to focus especially on why taking the *product* of $g'(f(x))$ with $f'(x)$ should give the derivative of $(g \circ f)$ at x.

The hardest part of this extra credit assignment is to think of physical examples where "composition of functions" arises naturally, *and* whose derivatives are interpretable!

As a hint of a situation where composition arises naturally: If the value of f depends on something, then you want g to be something that depends on the value of f. For example, f might be the temperature of some body of water as a function of time, and g may be the density of water in that body of water, as a function of temperature. Then the composition $g \circ f$ is a function telling you the density of water as a function of time! (Okay, now you have to come up with your own example for credit.)