Calc I - Written HW
Deriving differentiation rules from the definition

Here are a couple of HW problems from Wed, Jan 29. Note that these are not to be collected; they are practice problems to help you do well on our next exam, which is next Fri, Feb 7.

1. Assuming that f and g are differentiable function, use the definition of the derivative to show that
$$\frac{d}{dx}(2f(x)) - 3g(x)) = 2f'(x) - 3g'(x).$$

2. Use the definition of the derivative to show that
$$\frac{d}{dx}x^5 = 5x^4.$$

Comments

These problems are not meant to illustrate the *use* of the differentiation rules; rather, they are meant to help us understand *why* the differentiation rules are true.

Here are two videos that parallel trickiest parts of our class lecture fairly closely:

- Derivative of x^4: https://www.youtube.com/watch?v=NKUm-4PU5cw
- Proof of sum rule: https://www.youtube.com/watch?v=uCLZyTliZj0