Math 103, Fall 2014
Week 6

After Class Homework
Due Monday, October 13

1. Write an equation representing the following: "The acceleration of a spring is proportional to its displacement, but in the opposite direction." (The displacement of a spring is how far the spring has been pushed or stretched out of its rest state; displacement is a kind of position, so its derivatives have the same names as the derivatives of position—the first derivative of displacement is velocity, and so on.)

2. Find $\frac{d^{75}}{dx}(xe^x)$

3. Find $\frac{d}{dx}\sin e^{\tan \ln x}$

4. $\mathrm{Si}(x)$ is a function with $\frac{d}{dx}\mathrm{Si}(x) = \frac{\sin x}{x}$. What is $\frac{d}{dx}\mathrm{Si}(x^4)$?

5. You know the following values of f, f':

	1	2	3	4
f(x)	3	2	1	4
f'(x)	4	3	2	1

   What is $\frac{d}{dx}f(x^2)|_{x=2}$?