1. What are the names of the members of your group? Consider also exchanging contact information for future notes or study groups.

2. Find the derivatives for the following functions. Assume k and a are constants. Make a note of the rules you are using, and write down the general form of these rules.

   (a) $g(x) = x^k + k^x$

   (b) $f(x) = \dfrac{x^3}{9}(3\ln x - 1)$

   (c) $h(v) = e^{\tan(\sin v)}$

3. Write and solve a definite integral problem which requires the use the substitution technique. Now, can you come up with a more complicated example? (Hint: if you really understand the idea of substitution, it should be easier to create a complicated example than to solve a given one.)

4. Find all critical points for $f(x) = x - \ln x$. Then find the global minimum and maximum on the interval $0.1 \le x \le 2$.

5. Graph and find the area of the region enclosed by the graphs of the two functions $f(x) = x^2$ and $g(x) = x + 2$.

6. Find the derivatives for the following functions. Assume k and a are constants. Make a note of the rules you are using, and write down the general form of these rules.

   (a) $f(s) = \dfrac{a^2 - s^2}{\sqrt{a^2 + s^2}}$

   (b) $g(x) = \displaystyle\int_2^{3x} e^{t^2}\, dt$

7. A container in the shape of a right circular cylinder with no top has surface area 3π ft^2. What height h and base radius r will maximize the volume of the cylinder?

8. HOMEWORK: We don't usually have homework, but your homework this week to go to the Math Learning Center in SEO 430 so that you know where it is and how it works. Next time, I will ask you to convince me you went there and looked into it by telling me some fact about the room or the schedule or the facilities (can you check out books? laptops? have study groups?). The easy way will be to walk with me right after class, when I can walk you all over to the MLC so you have no trouble finding it.