HW 1: Group Work and Calc I review

Due: Thursday, September 5th in class

Purpose: This homework has a two main goals:

- Establish a successful environment for *productive* group work.
- Review some important calculus skills.

Task: Work in your group to answer the following questions. The final few questions are reflections on how the group work went and can be answered after class if we run out of time.

Questions:

1. What are the names of your fellow group mates? What is one interesting fact about them?
2. In this class we will spend a large amount of time working in small groups.
   - What expectations and behaviours lead to productive group work?
   - What are different roles members can hold in a productive group?
   - What are potential pitfalls or challenges to productive group work?
3. Lewis & Clark recently built two Olympic size swimming pools in the basement of Pamplin (this may or may not be true). As a prank, students filled one of the swimming pools with beach balls and the other with ping pong balls. Of course, each pool still has a lot of empty space in between the balls. Which pool has more empty space? Explain why and convince your group mates.
4. Problem 2.2.10 (This means section 2.2 in the book, problem number 10.) Compute the derivative of $f(x) = \frac{2}{2x-1}$.
5. Find an antiderivative of $f(x) = x^3 + \sin(x)$.
6. Find a function $f(x)$ satisfying the conditions $f'(x) = 4\cos(x) + e^{2x}$ and $f(0) = 5$.
7. In at least one full English sentence, explain what the derivative of $f(x)$ means. Give an example of a derivative in the real world.
8. This question should be answered individually. How successfully did your group function today? What did your group do well? What could your group improve on? What types of norms or behaviours do you think this class should use to ensure productive group work in the future?

If you have extra time, discuss the last question as a group.