Problem 1. (10 pts) The American Society of Mechanical Engineers (ASME) recently listed the top ten mechanical engineering achievements of the past century. In alphabetical order, these were:

1. Air conditioning and refrigeration
2. Agricultural mechanization
3. Automobiles and highways
4. Aviation
5. Bioengineering
6. Codes and standards
7. Computer-aided engineering (e.g. design, and manufacturing)
8. Integrated circuits
9. Manned spaceflight/Apollo program
10. Power generation

What do you think will be three significant mechanical engineering achievements of the next 50 years, if we limit consideration to new technologies only? Explain your choices briefly.

Problem 2. (10 pts) Chapter 2 of the Petroski book discusses the paper clip, which is an incredibly successful product that nevertheless has been the subject of numerous efforts to improve it. Scissors are another product with a very consistent, recognizable form that people know intuitively how to use, but that doesn’t mean that they’re perfect. Can you name two properties of conventional scissors that could stand to be improved, and can you come up with a modified scissor design that addresses these properties? Sketch and describe the design briefly.

Problem 3. (5 pts) In class on the 16th we started to discuss the difference between continuous and discrete data. There are people out there who check weather forecasts compulsively because they’re obsessive about wearing clothes that are appropriate to the current temperature. If you work, say, at a weather reporting station in Baltimore, and your job is to record temperature data, at what approximate time interval (15 minutes? One hour? Ten hours? A week?) do you think you should record instantaneous temperatures if your goal is to capture all temperature fluctuations? Describe your reasoning.