Submit your solutions to the following problems in lecture on the due date above. Present your work in a clean and organized fashion, either on a printed copy of this document (preferred) or a separate sheet of paper. As stated in the syllabus, late submissions will not be accepted.

1. Suppose you want to build a jewelry box with a square bottom and open top. If you have 12 ft$^2$ of building material, what are the dimensions of the box with the maximum volume?

2. Suppose you are swimming 20 ft/sec in a 20ft by 48ft pool, long-ways in the middle lane (i.e. 10 ft from each of the longer sides). There is a lifeguard standing at the corner of the pool, watching you swim away. How fast is your distance from the lifeguard changing when you are halfway across the pool?