Written Assignment 4 (due 2/01/13 by end of class)

Exercise 1: Consider the space $\mathbb{R} \times \mathbb{R}$. Define $\mathcal{B}$ to the the collection of all open balls in $\mathbb{R} \times \mathbb{R}$, together with the empty set.

(a) Show that $\mathcal{B}$ is a basis.

(b) Show that the topology generated by $\mathcal{B}$ is the product topology (that is, the produect of the usual topologies on $\mathbb{R}$).

Section 16: # 1, 3, 6, 10 (Note that the book talks of the dictionary order topology on $\mathbb{R} \times \mathbb{R}$, which is their name for the order topology example which I did on this space in class).