**373 Math Problems**

**Sheet #3**

**From Text book:**

2.5:1,2,3,4,5,9.10.

**Additional Problems:**

1. Find a base for the open half-line topology which is different from the topology itself.
2. Let be a topological space and a base for . Prove that is dense in X iff each nonempty element of contains a point of *A*.

**Definition:**

Two collections of subsets of *X* are equivalent bases iff there exists a topology for *X* such that are both bases for

1. Let be a topological space, a base for , and a collection of subsets of X Prove that are equivalent bases iff
2. For each and
3. For each .
4. Let be a collections of subsets of X both satisfying (a) and (b) of Prob.(3) above. Prove that are equivalent bases iff