373 Math Problems

From Text book:

2.1: 1, 4, 5, 6, 7.

2.2: 1,2 , 4, 5, 6, 7, 8, 9.

Additional Problems:

1. List all topologies for a set containing three distinct elements.
2. Prove that for a non empty set X, the collection is a topology on X, this topology is called co-countable topology.
3. Is there a set in which discrete and indiscrete topologies coincide on it?
4. Give an example of a nontrivial topology on an infinite set X which has only a finite number of elements.
5. If are two topologies on X, is a topology on X? Is a topology on X?
6. Prove that is the discrete topology on X iff every point in X is an open set.
7. Let . For each define .Let . Prove that is a topology on X.