Please turn in the solutions on Monday, September 29, in class. Each problem here is worth 2 points.

**Question 1** (Qual Exam from June 1998). Let $X$ be a set. Prove there exists the smallest topology on $X$ which makes $X$ a $T_1$ space (points are closed sets).

**Question 2.** Do problem 2 on page 92 in Munkres.

**Question 3.** Do problem 4 on page 92 in Munkres.

**Question 4.** Let $X$ be a topological space and $A \subset X$ a subset of $X$. Prove or disprove: $\overline{A} = \text{Int}(A) \cup A'$.

**Question 5.** Do problem 4 on page 100 in Munkres.