國立清華大學命題紙

八十六學年度 數學系 系（所） 純數 組碩士班研究生入學考試

科目 拓樸學 科號 0104 共 1 頁第 1 頁 *請在試卷【答案卷】內作答

1. (10 points)
   Prove that every compact subset of a topological Hausdorff space is closed.

2. (15 points)
   Show that the one point compactification of the real line R (in the usual topology) is homeomorphic with the circle S^1, where $S^1 = \{(a,b)/a^2+b^2=1\} \subseteq R^2$ (in the usual topology).

3. (15 points)
   Let A be a connected subset of a topological space Y. Then show that if $B \subseteq Y$ and $A \subseteq B \subseteq \overline{A}$, then B is also connected, where $\overline{A}$ is the closure of A.

4. (20 points)
   Let f be a continuous mapping of a compact metric space X into a metric space Y. Show that f is uniformly continuous on X.