Assignment 3. Due September 30.

1. Given a continuous function \( f(x) \) on a closed subset \( C \subset [0, 1] \) define an extension of \( f \) from \( C \) to \([0, 1]\) as follows: If \( x \notin C \) then there is an interval \((a, b)\) such that \( a < x < b \), \((a, b) \cap C = \emptyset\) and \( a, b \in C \). Extend \( f \) between \( a \) and \( b \) by linear interpolation. Show that this extends \( f \) as a continuous function to all of \([0, 1]\).

2. Prove proposition 7 on page 85 of text. See the hint in the problem following the proposition.