MAT 360
Homework 3

Please do questions 91, 93, 95, 101, as well as the questions below.

**Problem 1.** Prove theorems from section 53 in the book. (Argue by contradiction, use the theorem in section 52.)

**Problem 2.** Four houses $A, B, C, D$ are at the vertices of a square. The residents would like to dig a well at a point $W$ such that the sum of distances $AW + BW + CW + DW$ from all the houses to the well is the smallest possible. Where should they dig the well? Prove your answer.

**Problem 3.** Suppose that points $D$ and $E$ lie inside the triangle $\triangle ABC$. Consider the triangle $\triangle ADE$. Prove that the perimeter of $\triangle ABC$ is greater than the perimeter of $\triangle ADE$. 