The problems are available at `http://jan.ucc.nau.edu/ns46/pow`. Paper copies are provided outside the Math Office: Room 107, Adel Mathematics Building. Contact Nándor Sieben (Adel 175) if you have any questions about the problems. Please submit your solutions to the Math Office by Monday 11/2/09. Winning solutions and a summary of scores are at the POTW bulletin board in the Adel Math Building.

Research problems with unknown solutions are marked by (!). These problems might be hard or might be easy, we just do not know. A conjecture or a result about a special case or simply an idea about a possible solution method can be very valuable.

Trouble in Trapezia

Trapezia, a small country with the shape of a trapezoid, has an area of 1 square mile. Alvin, Bertreus, Connie, and David each have a tower at a corner of Trapezia's boundary where they look out for invaders. The border between Alvin and Bertreus is parallel to the border between Connie and David. Bertreus and Connie could not get along, which caused great political turmoil. The leaders decided that the only solution was to split the country into three separate regions. Eggbert lives on the border exactly in the middle of Bertreus and Connie, so he volunteers to build two straight fences. One of them connects his house to Alvin's tower, the other runs from his house to David's tower. What is the area of the region where neither Bertreus nor Connie live?