Re-Shaping the Moving Sofa Problem

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Abstract

In 1966, Leo Mosler published the following problem: What is the largest area of a rigid two-dimensional shape that can be maneuvered to fit through a unit-width L-shaped corridor? Known as the Moving Sofa Problem, this question has continued to elude mathematicians. John Hammersley gave the best known lower bound of the couch in 1968. However, the current best solution was found by Joseph Gerver in 1992. After realizing that both the Hammersley Sofa and Gerver's Sofa were shaped like a semi-circle, I decided to figure out if a semi-circular figure truly gave the largest area. In order to do this, I tried to solve the Moving Sofa Problem using only regular shapes. I found the largest area of a circle, square, rectangle, and semi-circle that would fit through the L-shaped corridor, and compared the results.