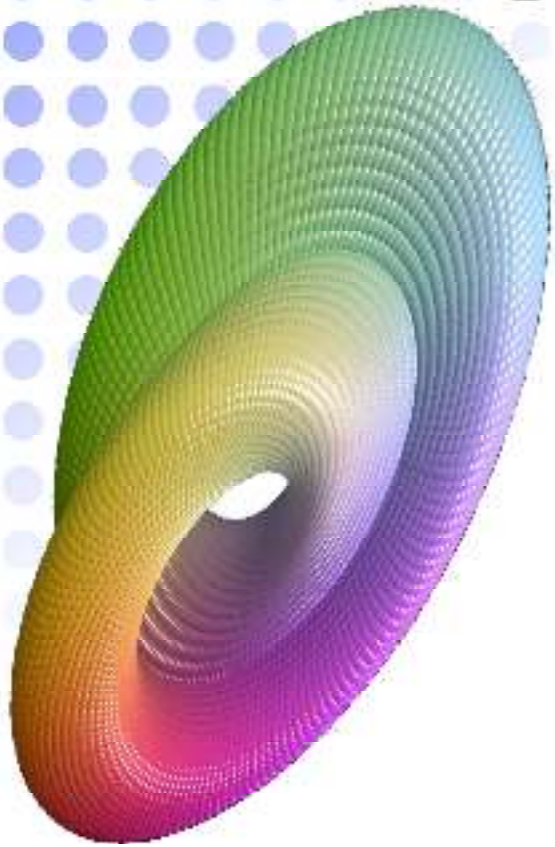
Michigan Math Club

Thursday at 4pm in the Commons

Free Pizza and Pop



Pick's Theorem, Farey Seqences, and the Geometry of Numbers

Zachary Scherr

Abstract for 9 April

The Farey Sequence of order *n* is the sequence of completely reduced fractions between 0 and 1 which, when in lowest terms, have denominators less than or equal to *n* (the terms are arranged in order of increasing size).

In this talk we will investigate some very cool properties of Farey Sequences and use geometry to prove them. In particular, we will prove and use Pick's theorem, which says that, given a simple polygon *P* having its vertices at lattice points in the plane, there is a simple formula for calculating its area; namely,

$$\text{Area}(P) = I + B/2 - 1$$

where *I* is the number of lattice points contained in the interior of *P*, and *B* is the number of lattice points on *P*'s boundary.