

The slicing game

a problem presented by James Propp
at Peter Winkler's problem session
at MSRI on April 12, 2012

Given a finite collection L of lines in the plane, and some polygon P in the plane, must there exist some finite collection L' of lines in the plane, containing L as a sub-collection, such that L' slices P into triangles?

That is: Suppose one plays a solitaire game whose starting configuration is L and P . Can one always draw finitely many additional lines so as to obtain a new collection L' that slices P into triangles?

This problem was first raised by me in Richard K. Guy and Richard J. Nowakowski's American Mathematical Monthly column on open problems (see "Bite-Sized Combinatorial Geometry Problems", AMM, Vol. 103, No. 4, Apr. 1996, p. 342 and "Monthly Unsolved Problems", AMM, Vol. 104, No. 10, Dec. 1997, pp. 969-970). Stan Wagon invited the readers of his on-line column to completely solve a one-parameter class of problems of this kind in which three lines symmetrically divide an equilateral triangle; see

<http://mathforum.org/wagon/spring96/p812.html>

As far as I know, there has been no progress on the general problem, of either a positive or a negative nature.