



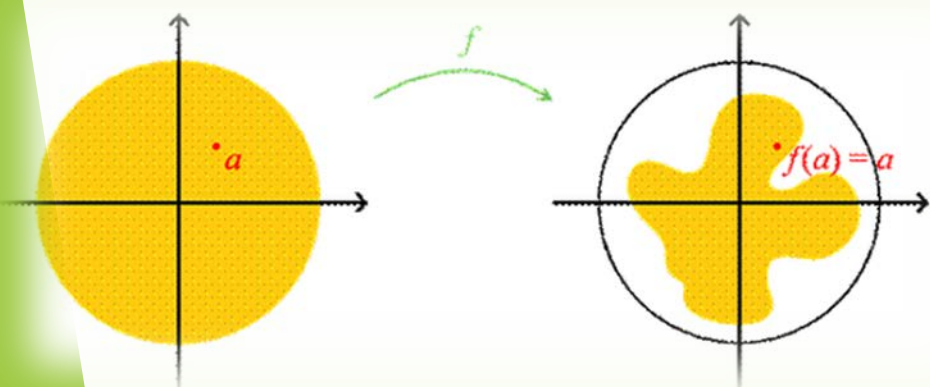
Radical Pi presents:

# Cutting squares into equal-area triangles

by Professor James (Jim) Fowler

An important feature of Radical Pi and other pizza-and-math events is the "equidecomposition" of pizzas into equal-area triangle-shaped pieces. Suppose, however, that our pizzas were square. For which integers  $n$  can we divide our square pizzas into  $n$  triangles having equal area? For even  $n$ , this is easy, but what about for odd  $n$ ? Somewhat surprisingly, it cannot be done. More surprisingly, a proof of this fact uses a 2-adic valuation on the reals!

Disregarding the culinary question of using 2-adic valuations as a topping, we'll prove that a square does not admit an equidecomposition into an odd number of triangles. We will discuss some amusing generalizations to other polygons. In the meantime, we may accidentally prove Brouwer's fixed point theorem (as Sperner's lemma is at the heart of both these equidecomposition questions and the combinatorial proof of Brouwer's fixed point theorem).



Wednesday, Nov. 4th, 5 PM  
Undergraduate Math Study Space (MA 052)  
**Free pizza!**

