

**PROBLEM 5: ACUTE TRIANGLE SUBDIVISION**  
**UNDERGRADUATE PROBLEM SOLVING CONTEST**  
DUE MARCH 12, 2009 BY 5:00 PM

**Definitions:** An obtuse triangle has an interior angle larger than 90 degrees. An acute triangle has three interior angles of less than 90 degrees. A triangle subdivision is the dissection of a triangle into smaller triangles which exactly fill the original triangle but may overlap only along their boundaries.

**Primary Question:** Given an arbitrary obtuse triangle, is it possible to construct a triangle subdivision consisting only of acute triangles? If not, provide an argument (a formal proof is not necessary) of why this is impossible. If so, what is the triangle subdivision with the fewest number of acute triangles, and why is that number the fewest?

In the spirit of the UPSC, you should not search the internet or look the solution up in a book.