# THE 25th ANNUAL GREEN CHICKEN CONTEST

OCTOBER 19, 2002

1. Prove that for $n \geq 6$, an equilateral triangle can be dissected into n equilateral triangles.

2. Three $12' \times 12'$ squares are each cut into two pieces, A and B, by joining midpoints of two adjacent sides. These six pieces are then attached to a regular hexagon, as shown below, so as to fold into a polyhedron. Find the volume of this polyhedron.
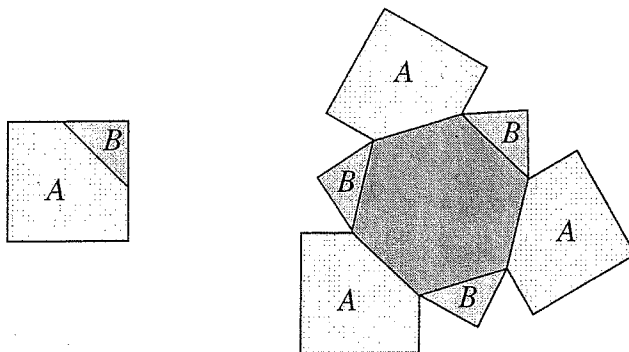
3. A special 25×25 chessboard is made for the twenty-fifth anniversary of the Green Chicken. Is it possible to start with a knight at some corner of the board and return to its original position after visiting each square of the board exactly once?

4. There are n points given on the circumference of a circle, and the chords determined by them are drawn. If no three chords have a common point, how many triangles are there all of whose vertices lie *inside* the circle. The figure below shows an example with six points on the circle and one such (shaded) triangle.
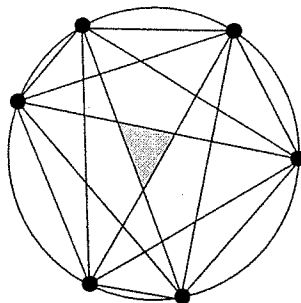
5. Given 69 distinct positive integers not exceeding 100, prove one can choose four of them, say a, b, c, d, such that $a < b < c$ and $a + b + c = d$.

6. Given $2n + 2$ points in the plane such that no three lie on the same line, show that there are two points that determine a line which separates n of the points from the other n.

"Life is pain. Anyone that says different is selling something." — Fezzik's Mother