# Geometry
Senior League

1. A circle inscribed in the right angle of an isosceles right triangle divides the hypotenuse into three equal parts. The leg of the triangle is of length 1. Find the radius of the circle.

2. The length of each bisectors of a triangle is at least one unit. Prove that its area is at least $\sqrt{3}/3$.

3. A chain of three equilateral triangles $ABC$, $CDE$, and $EFG$, whose vertices are written counterclockwise, is arranged so that $D$ is the midpoint of $AG$. Prove that triangle $BFD$ is also equilateral.

4. For any four vertices of a convex polyhedron, the tetrahedron with these vertices lies inside the polyhedron. Does there exist a polyhedron such that none of such tetrahedrons lies inside it?