

Problem 3. A triangle is covered by 25 circles of radius 1. Prove that this triangle can be covered by 100 circles of diameter 1.

Solution. Join the midpoints of the sides of our triangle T . The triangle T is now divided into four triangles, each similar to T with scale factor $1/2$. Thus, each of the four triangles can be covered by 25 circles of radius $1/2$ (i.e. diameter 1). It follows that T can be covered by 100 circles of diameter 1.

Problem. Which plane figures F can be divided into some number of pieces, each similar to F with scale factor $1/2$ (or scale factor s for some real number s)?