PROBLEM OF THE WEEK Solution of Problem No. 14 (Fall 2004 Series)

Problem: Let K be any circle, and let A, B be distinct points on K. Describe the locus of the centroids of all triangles ABC with $C \in K$.

Solution (by Georges Ghosn, Quebec)

The centroid G of the triangle ABC is the image of C in the homothety with homothetic center I the middle point of AB and semilitude ratio $\frac{1}{3}$. $(\overrightarrow{IG} = \frac{1}{3}\overrightarrow{IC})$

So the locus of G is the circle K' image of K by this homothety. K' has the centroid of OAB as a center and a radius equal $\frac{1}{3}$ the radius of K. (O is the center of K)

Also solved by:

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