New Trends in Dynamic Geometry

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Keywords: dynamic geometry, iterative processes, asymptotic behaviour.

Given a fixed plane configuration $\mathcal{F}_0$ and a sequence of plane transformations $(T_n)_{n\geq 0}$, one can define a *dynamic geometry* as the iterative process described by

$$\mathcal{F}_0 \xrightarrow{T_0} \mathcal{F}_1 \xrightarrow{T_1} \mathcal{F}_2 \xrightarrow{T_2} \cdots \xrightarrow{T_{n-1}} \mathcal{F}_n \xrightarrow{T_n} \mathcal{F}_{n+1} \xrightarrow{T_{n+1}} \cdots .$$

After n steps the initial configuration $\mathcal{F}_0$ is transformed into $\mathcal{F}_n$ by the composition $T_{n-1}\circ\cdots\circ T_0$. The initial configuration $\mathcal{F}_0$ can be any general pattern defined using polygons, circles, or associated geometric elements (see [2], [3], [4], [5], [7]).

Some concrete problems arising in the study of a dynamic geometry include:

1. Compute the n-step configuration $\mathcal{F}_n$ and its geometric elements;
2. Investigate the convergence of the sequence $(\mathcal{F}_n)_{n\geq 0}$;
3. Study the convergence in shape of the sequence $(\mathcal{F}_n)_{n\geq 0}$;
4. If the above sequence is convergent, then try to identify the limit and find convergence order of some of its elements;
5. Obtain properties of the initial configuration $\mathcal{F}_0$ from the study of the geometry of $\mathcal{F}_n$ for some $n \geq 1$.

This session invites contributions related to the above topic, including recurrent patterns, fractals, difference equations, connections to fixed point theory or other iterative processes whose exploration is linked to geometry.

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