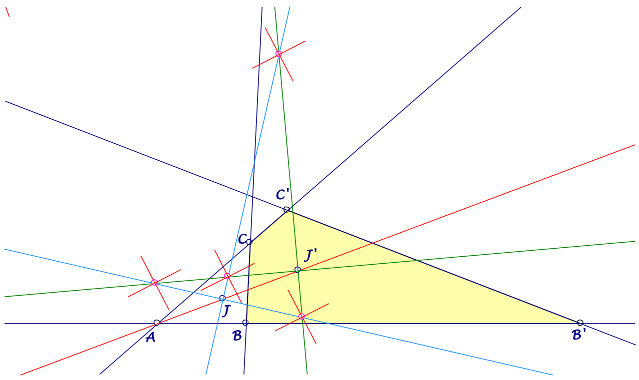
EQF-Note 2015-05-02

Background for these notes is:
Chris van Tienhoven: Encyclopedia of Quadri-Figures
http://www.chrisvantienhoven.nl/

Construction of Morley's 4L-axes II

Morley describes in his paper "Extensions of Clifford's Chain-Theorem" for a 4-line 64 axes, but Morley doesn't mention a construction. In his paper "64 axes of the QL" Bernard Keizer gives an interpretation and a construction of these axes, see QFG-message 1032. Further constructions are described in QFG-message 1056 and 1068. Here is a new – very simple – construction, orientated at orthogonal intersections of the axes.



The orthogonal intersections

Consider a 4-line and two perspective triangle components *ABC* and *AB'C'* wrt a common vertex *A* (see figure: *J* incenter of *ABC*, *J´* incenter of *AB´C´*):
… Let J_i and J_i' corresponding in-/ex-centers of *ABC* and *AB´C´*.
… An angle bisector at *A* contains two in-/ex-centers J_i of *ABC* and two in-/ex-centers J_i' of *AB'C'*.
… The intersections of the angle bisectors of $<AJ_iB$ and $<AJ_j'B'$ give 4 intersections of orthogonal Morley-axes with the same directions.
… For the two possibilities of $i = j$ there are 8 intersections of orthogonal Morley-axes with the same directions, analog for $i \neq j$ wrt the other possible orthogonal directions.
… Wrt one angle bisector at *A* we get 16 intersections, taking the other angle bisector at *A*, we get further 16 orthogonal intersections.
… The intersecting orthogonal axes in these 32 points are all 64 Morley-axes.

The orthogonal directions

Each direction of a line has a mean direction wrt the 4 lines of a quadrilateral. This mean direction is one of the four possible directions of Morley-axes. We consider the orthogonal mean directions of the angle bisectors at *A* as primary directions and the other two as alternative directions.
The directions of the orthogonal axes in the intersections of the angle bisectors of $<AJ_iB$ and $<AJ_j'B'$ depend on whether $i = j$ or $i \neq j$ and whether J_i and $J_j´$ lie on an inner or outer angle bisector at *A*.

Ji and Jj´	$i = j$	$i \neq j$
... on inner angle bisector at A	*primary directions*	*alternative directions*
... on outer angle bisector at A	*alternative directions*	*primary directions*

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