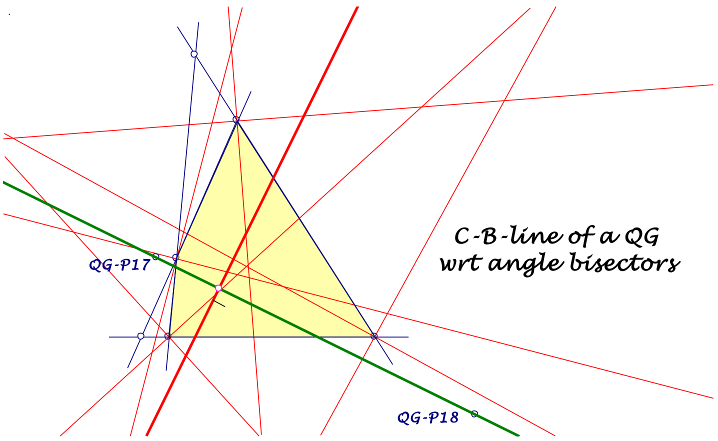
EQF-Note 2017-07-08

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

Cayley-Bacharach Lines for a Quadrilateral

This geometric excursion shows, that the Cayley-Bacharach ninth line (see QFG-message 2511) is a relevant tool in EQF-geometry.



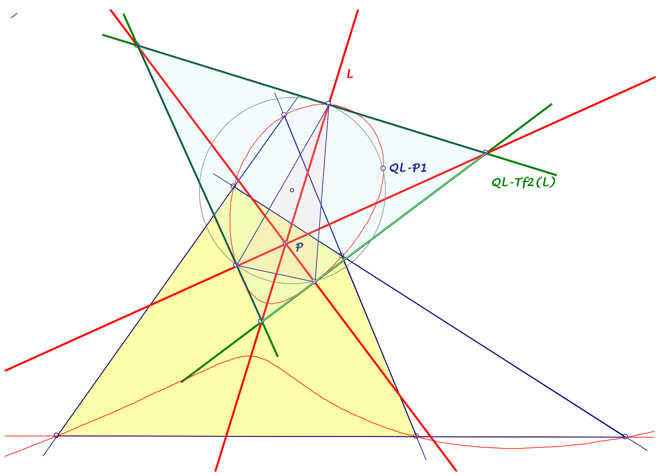
Let us start with a quadrigon and consider the eight angle bisectors.

- ***C-B*-line *L* of the eight angle bisectors of a quadrigon is *QL-Tf2(QG-P17.QG-P18).***

- **The *C-B*-line *L* of a *QG* and its *QL-Tf2*-image *QG-P17.QG-P18* are orthogonal.**

Now consider a quadrilateral and its three *QG*-versions:

- **The three *C-B*-lines for the *QG*-versions of a *QL* have a common point *P*.**



- **The point *P* is not in *EQF*: *1st DT*-coordinate**

  $$m^2\, n^2\, Sa^2\, (l^2\, Sb\, Sc\, a^2 + m^2\, Sc\, S^2 + n^2\, Sb\, S^2).$$

- **The trilateral *Tr* of the three lines *QG-P17.QG-P18* for a *QL* has the three *C-B*-lines *L* as altitudes.**

- **The nine-point circle of *Tr* bears *QL-P1*,**
  … its Simson line wrt the orthic triangle of *Tr* is parallel *QL-L2*.

- **The vertices of the orthic triangle of *Tr* are points on the cubic *QL-Cu1*,**
  … their *CSC*-partners are collinear on *QL-Cu1*.

- ***QL-Cu1* is isogonal invariant wrt the orthic triangle of *Tr*.**

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