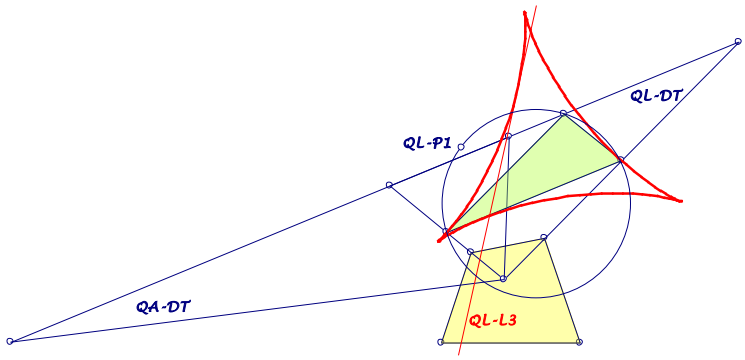
EQF-Note 2014-07-20

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

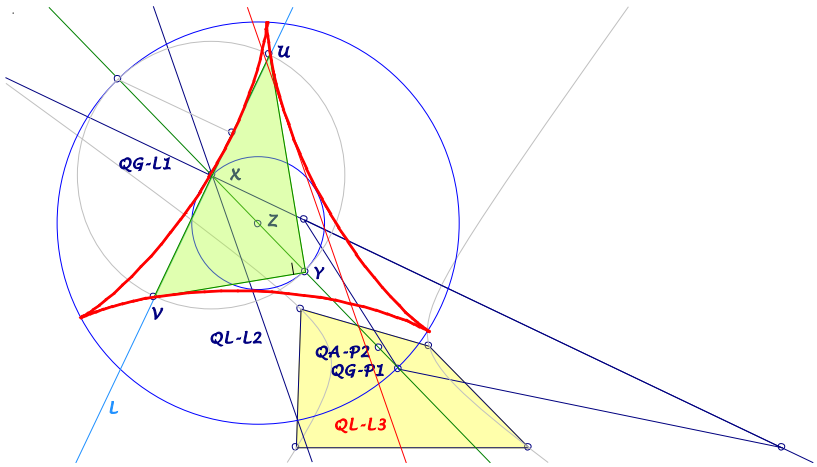
Two Deltoids wrt the Pedal Line QL-L3

For two special pencils of quadrigons the Pedal Lines QL-L3 envelope deltoids, which will be described as envelopes of Simson lines.



The quadrigons of the first pencil have the same diagonal triangles *QA-DT* and *QL-DT*.
QL-L3 is the Simson line of the Miquel Point *QL-P1* wrt the medial triangle of *QL-DT*, whose circumcircle contains *QL-P1*.
The Pedal Lines *QL-L3* envelope a deltoid, which is the envelope of the Simson lines of the medial triangle of *QL-DT*.

The quadrigons of the second pencil have the same Diagonal Triangle *QA-DT* with the same Diagonal Crosspoint *QG-P1* and the same Orthogonal Hyperbola *QA-Co2*.
The Pedal Lines *QL-L3* envelope a deltoid, which is the envelope of the Simson lines of a triangle, which can be constructed as follows:



… Let *X* be the common point of *QG-L1*, *QL-L2* and *QG-P1*.*QA-P2* (also midpoint of the intersections of *QG-L1* and *QA-Co2*).
… Let *Y* be the midpoint of *QG-P1* and *X*.
… Let *Z* be the midpoint of *X* and *Y*.
… Let C_1 be a circle round *Z* through *QG-P1* and C_2 a circle round *Z* through *X*. C_1 is the circumcircle and C_2 is the incircle of the deltoid.
… A perpendicular line *L* wrt *QG-L1* through *X* is tangent to the deltoid. The point of tangency is the pedal point of the reflection of *QG-P1* in *Z*.
… The circle round *X* through *Y* cuts *L* in *U* and *V* on the deltoid. The tangents in *U* and *V* at the deltoid intersect in *Y* perpendicular.
… The Simson lines of the orthogonal triangle *UVY* envelope the deltoid.

Eckart Schmidt
http://eckartschmidt.de
eckart_schmidt@t-online.de