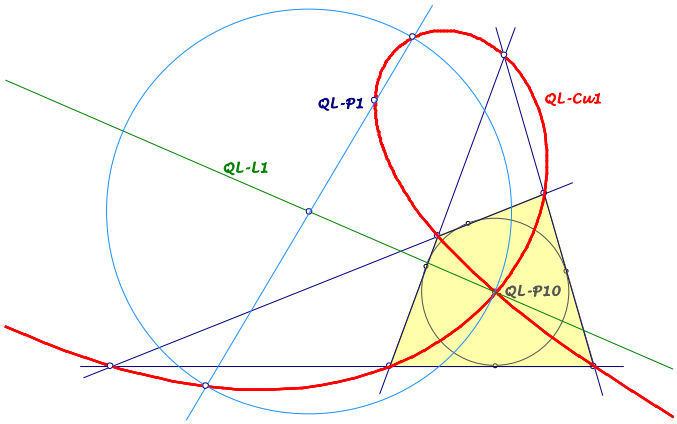
EQF-Note 2017-04-14

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

QL-Cu1 as Strophoide of a Tangential QL

For a quadrilateral with inscribed circle the cubic QL-Cu1 is a strophoid as Bernard Gibert describes in [1]. The corresponding cubic QL-Cu2 can be constructed in an alternative way using QL-Cu1 and its properties. The results are only CABRI-controlled.



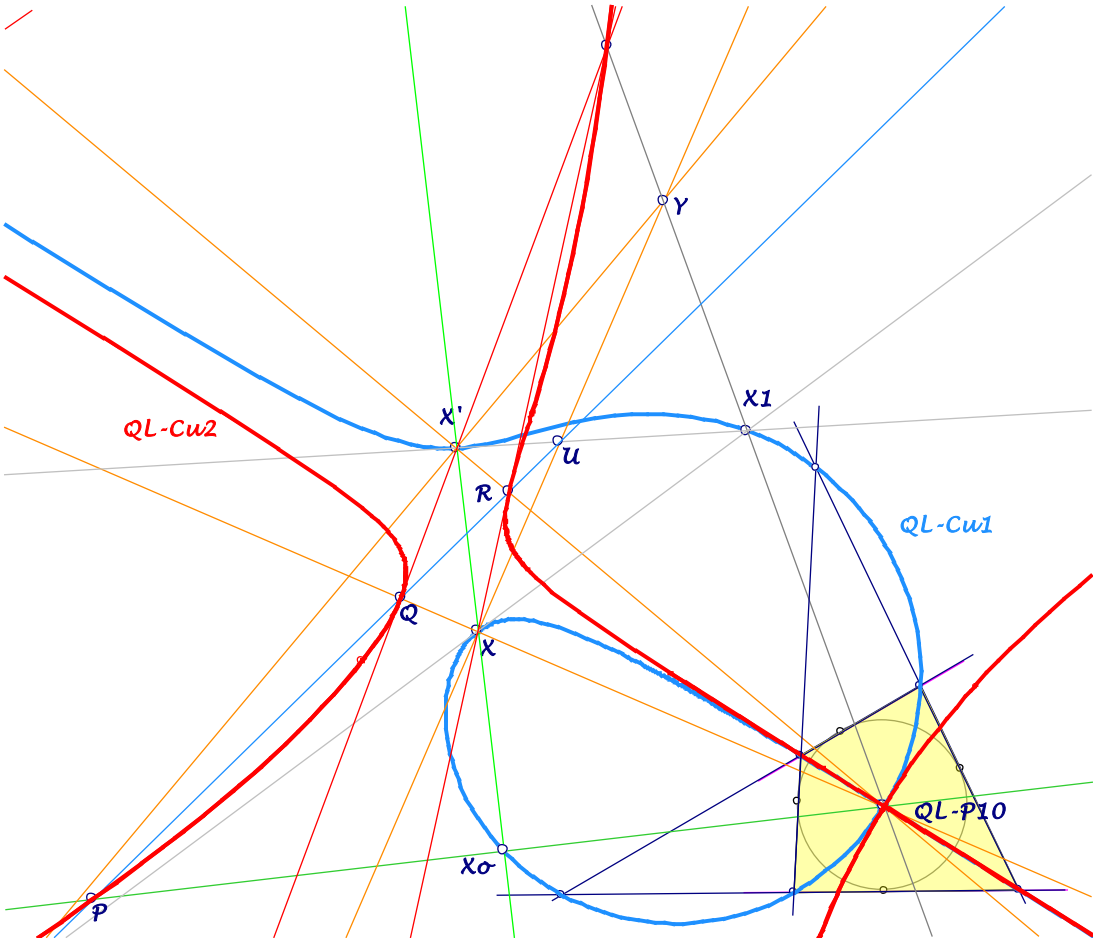
- **The cubic *QL-Cu1* of a quadrilateral with inscribed circle is a strophoid [1]**
  … of the line *QL-L1*,
  … with pole *QL-P1*
  … and fixed point *QL-P10*.

This cubic *QL-Cu1* and its properties now shall be used for a construction of the corresponding cubic *QL-Cu2*, which is a nodal stelloid with node *QL-P10*.

Let X and X' be two *QL-Tf2*-partner on *QL-Cu1*,
… X_0 the 3rd intersection of XX' and *QL-Cu1*
… and X_1 the *QL-Tf1*-image of X_0.

For points on *QL-Cu1* the polar conics wrt *QL-Cu2* are degenerated orthogonal hyperbolas:
… for X' the lines X.*QL-P10* and the perpendicular in X,
… for X the lines X'.*QL-P10* and the perpendicular in X'.
Let Y be the intersection of the two perpendiculars.

Consider the following points:
… $U = XY \cap X'X_1$, $V = X'Y \cap XX_1$,
… P = intersection of UV and perpendicular in X_0 to XX',
… $Q = UV \cap X$.*QL-P10*, $R = UV \cap X'$.*QL-P10*.



- ***P, Q, R* are points on *QL-Cu2*.**
- ***PX, QX´, RX* are tangents of *QL-Cu2* in *P, Q, R*.**
- **The tangents *QX´, RX* at *QL-Cu2* and the line *X1.QL-P10* intersect on *QL-Cu2*.**

References:

[1] http://bernard.gibert.pagesperso-orange.fr/files/Resources/eckart.pdf

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