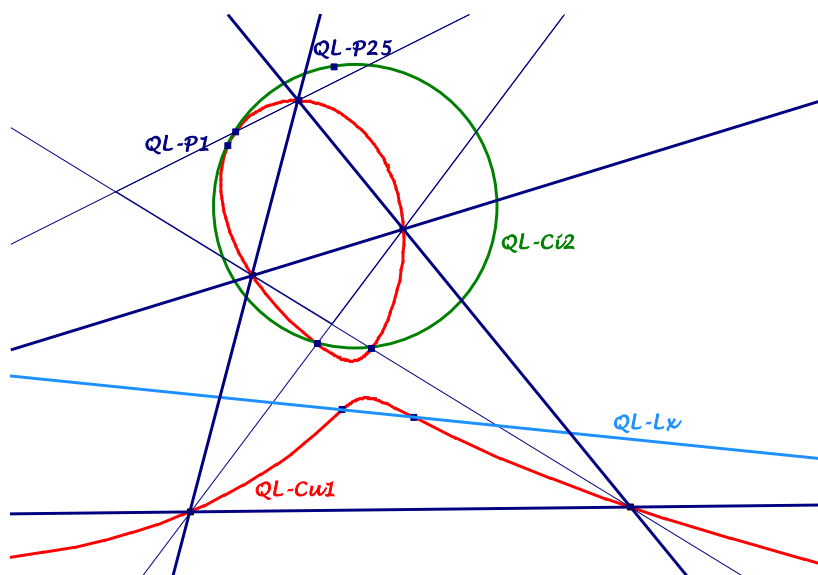


EQF-Note 2013-05-17

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

A Cubic, a Circle and a Line wrt a Quadrilateral

The cubic will be $QL-Cu1$, which contains the foci of inscribed conics, the circle will be $QL-Ci2$, the nine-point circle of the QL -diagonal triangle, and the line will be the Clawson-Schmidt Conjugate of the circle $QL-Ci2$. This line is not mentioned in EQF up to now. – Reference triangle for barycentric coordinates is $QL-DT$.

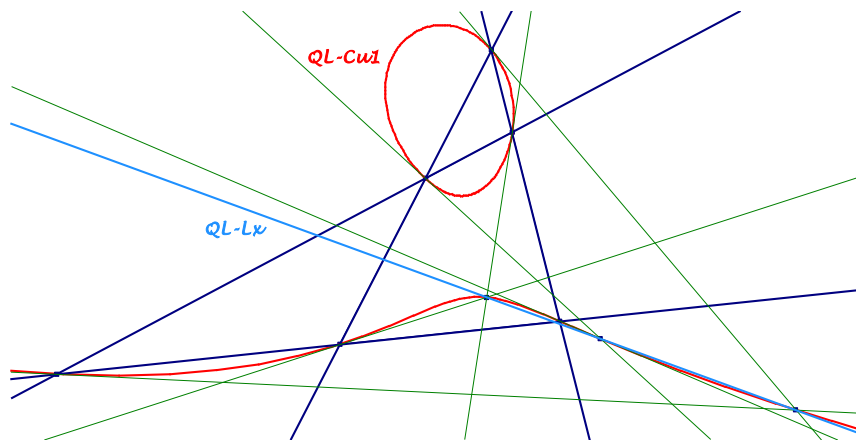


We start with the cubic $QL-Cu1$. The vertices of the orthic triangle of $QL-DT$ lie on this cubic as well as on the nine-point circle $QL-Ci2$ of $QL-DT$. The Clawson-Schmidt Conjugate $QL-Tf1$ of $QL-Ci2$ is a line $QL-Lx$, which cuts the cubic in the $QL-Tf1$ images of the vertices of the orthic triangle. Other points of $QL-Lx$ are the $QL-Tf1$ images of the Miquel Point $QL-P1$ and $QL-P25$.

The equation of the line $QL-Lx$:

$$\sum_{cycl} (l^4 a^2 (S^2 + 3S_B S_C) + m^4 b^4 S_A + n^4 c^4 S_A + 2m^2 n^2 S_A (S^2 - S_A^2) + 2l^2 m^2 (a^2 b^2 S_A + 2S^2 S_C) + 2l^2 n^2 (a^2 c^2 S_A + 2S^2 S_B)) x = 0$$

But there is a further connection to the cubic $QL-Cu1$: The tangents in opposite points of the quadrilateral intersect on the cubic in three collinear points on $QL-Lx$ (which are the $QL-Tf1$ images of the vertices of the orthic triangle).



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