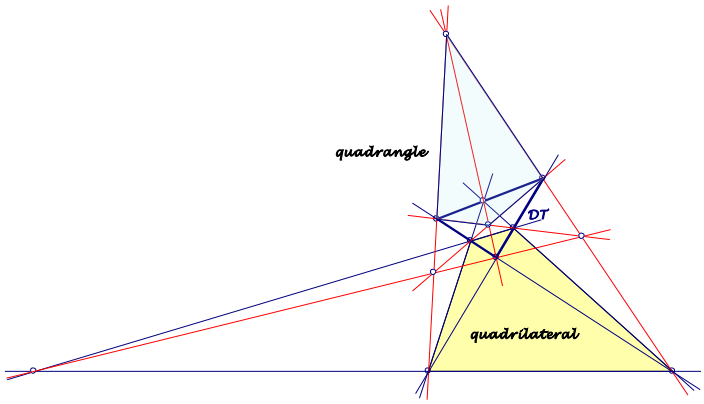
EQF-Note 2016-09-27

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

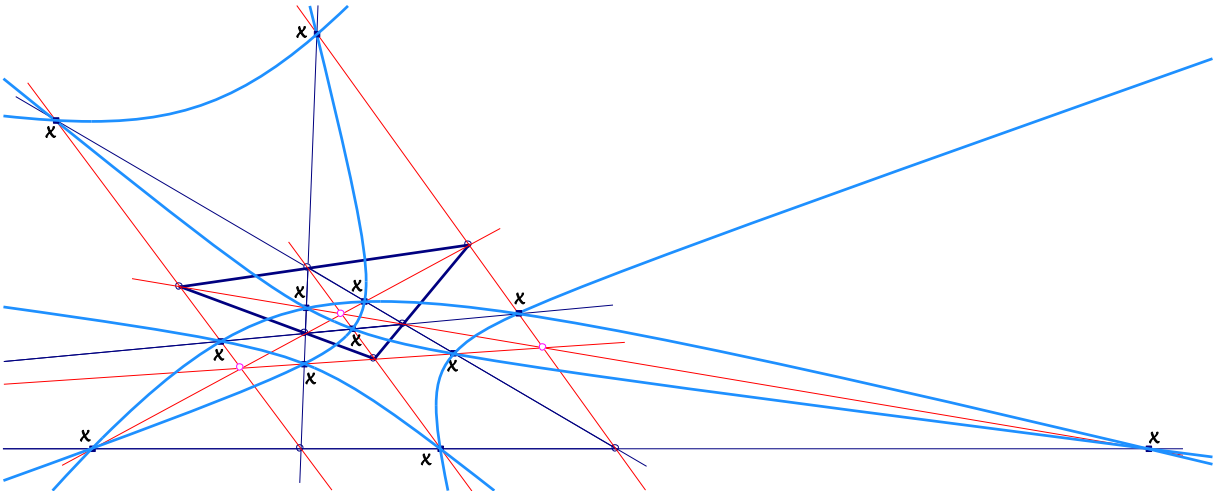
Conics in the dual QA/QL-constellation

Incidence geometry wrt a quadrilateral and its dual quadrangle leads to two triples of unexpected conics.

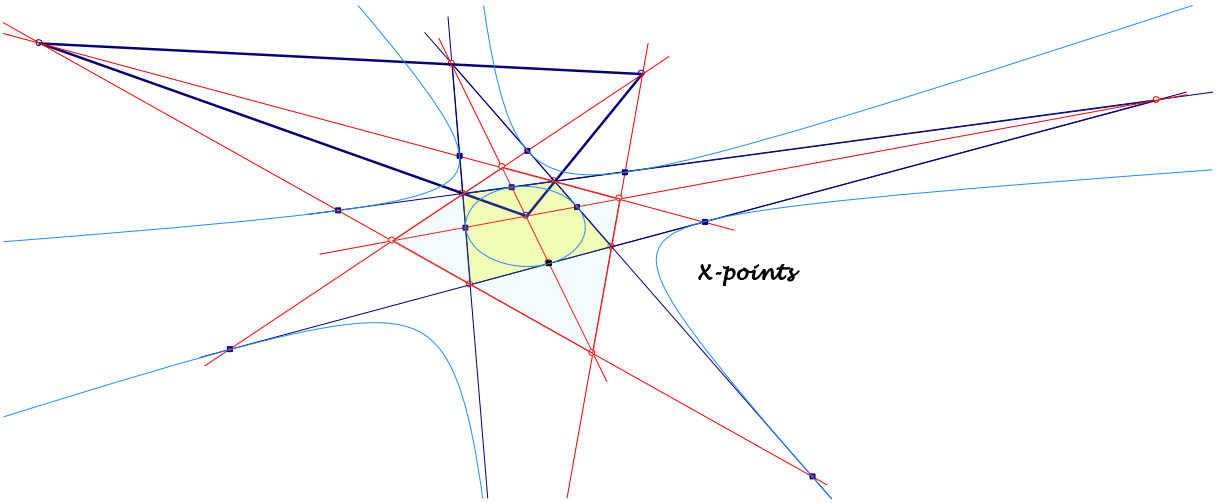


Consider a quadrilateral *QL* and its diagonal triangle *DT*. The lines from each *DT*-vertex to opposite *QL*-points on the opposite *DT*-sideline give the lines of the dual quadrangle *QA*.

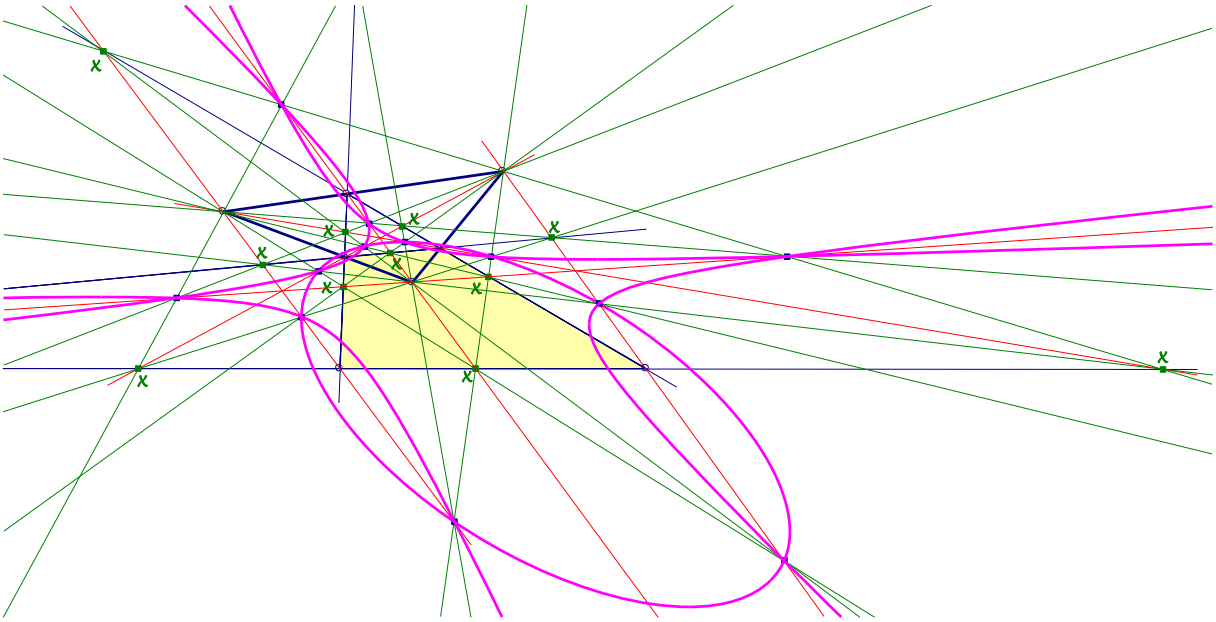
- **The *CSC*-images of *DT*-vertices wrt four of the *QA*-lines, not bearing the *DT*-vertex, coincide in *QA-P4* of the dual quadrangle.**

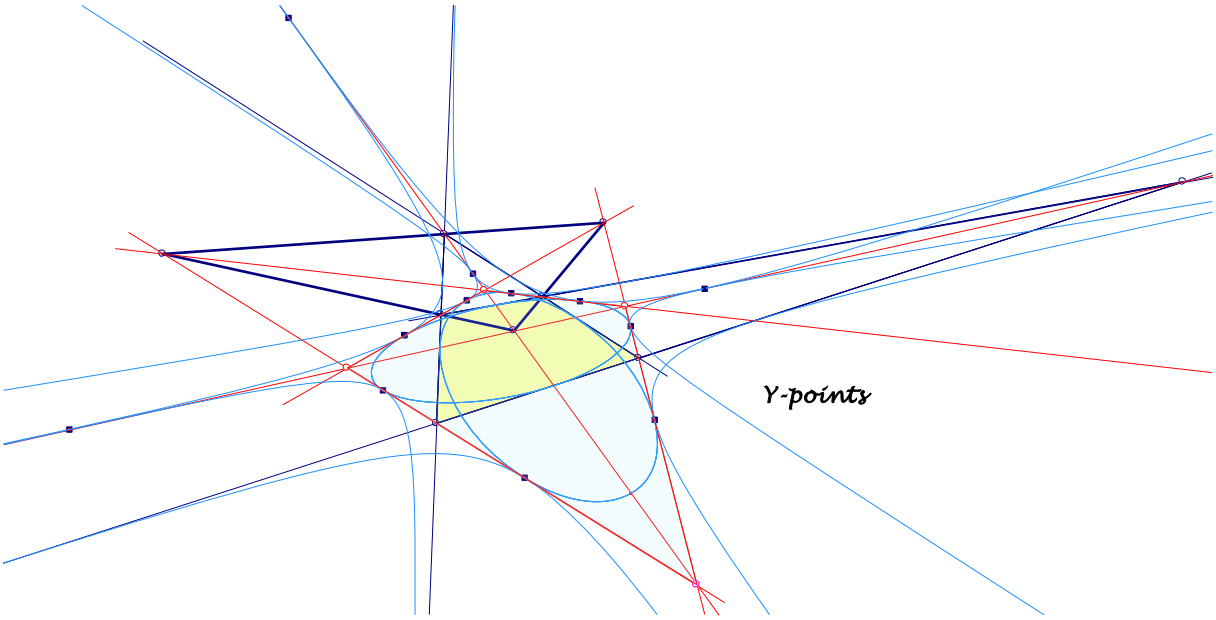


- **The six *QA*-lines intersect the *QL*-lines in 12 new points *X***
  … on three conics, each bearing eight points,
  ... intersecting in the *X*-points on the *QL*-lines,
  … which are the contact points of the conics *QG-Co1* for the *QL*-quadrigons .



- **Each *DT*-vertex is – beside the *QA*-lines – four times collinear with two conic intersections *X*,**
  ... corresponding lines intersect the *QA*-lines in 12 new points *Y*,
  … on three conics, each bearing eight points,
  … intersecting in the *Y*-points on the *QA*-lines,
  … which are the contact points of inscribed conics of *QA*-quadrigons tangent to two *QL*-lines intersecting on a *QA*-quadrigon diagonal.





For both conic triples the following properties hold:

- **The dual of one conic is a conic tangent to the other two conics.**

- **The polars of a *DT*-vertex wrt the three conics coincide in the opposite *DT*-side.**

For a *DT*-vertex there are two opposite *QL*-points on the opposite *DT*-side and two opposite *QA*-lines bearing the *DT*-vertex. This constellation has a corresponding conic in both conic triples.

- **The polars of opposite *QL*-points are opposite *QA*-lines wrt the corresponding conics.**

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