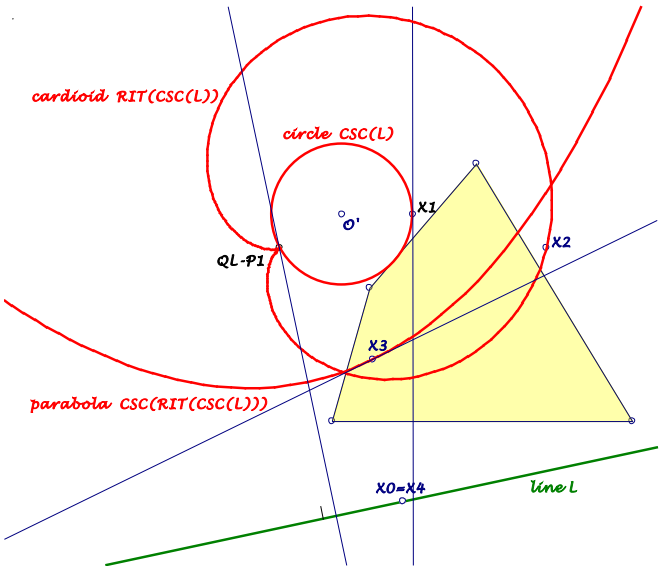
EQF-Note 2014-03-25

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

A Ring of Transformations

Two transformations will be considered:
*CSC(curve): **C**lawson-**S**chmidt **C**onjugates QL-Tf1 of points of the curve.*
*RIT(curve): **R**eflections of the Miquel Point QL-P1 **I**n **T**angents at the curve.*
Let L be a line, then holds:
RIT(CSC(RIT(CSC(L)))) = L.



L: Let *L* be a line.

CSC(L) is a circle through *QL-P1* with midpoint *O´* in the *CSC*-image of the reflection of *QL-P1* in *L*.

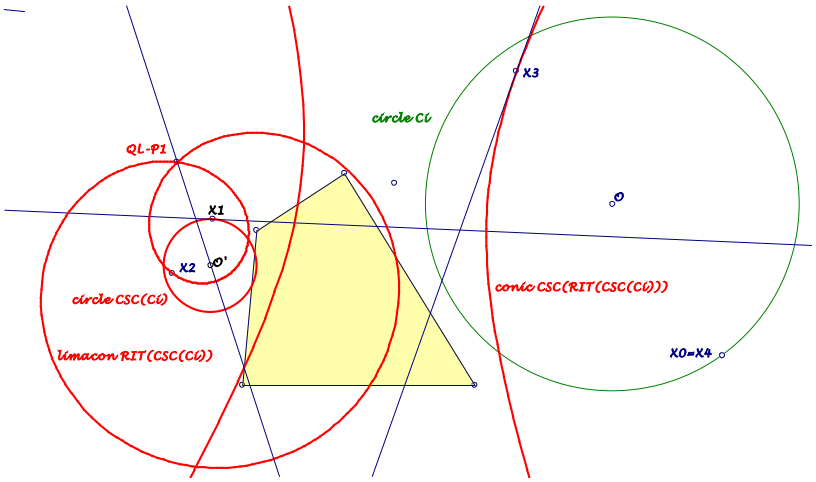
RIT(CSC(L)) is a cardioide with center *O´* and cusp *QL-P1*.

CSC(RIT(CSC(L))) is a parabola with focus *QL-P1* and directrix *L*.

RIT(CSC(RIT(CSC(L)))) is the line *L* again.

For example:

Let *L* be the Steiner Line *QL-L2*:
CSC(QL-L2) is the Miquel Circle *QL-Ci3*,
RIT(QL-Ci3) is the *QL*-Cardioide *QL-Qu1*,
CSC(QL-Qu1) is the Inscribed Parabola *QL-Co1*,
RIT(QL-Co1) is the Steiner Line *QL-L2* again.



We can also start with a circle.

Ci: Let *Ci* be a circle with center *O* (not containing *QL-P1*).

CSC(Ci) is a circle again with midpoint *O´* in the *CSC*-image of the inversion of *QL-P1* wrt *Ci*.

RIT(CSC(Ci)) is a limaçon with center *O´* and cusp *QL-P1*.

CSC(RIT(CSC(L))) is a conic centered in the midpoint of *O.QL-P1* with foci *O* and *QL-P1*.

RIT(CSC(RIT(CSC(L)))) is the circle *Ci* again.

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