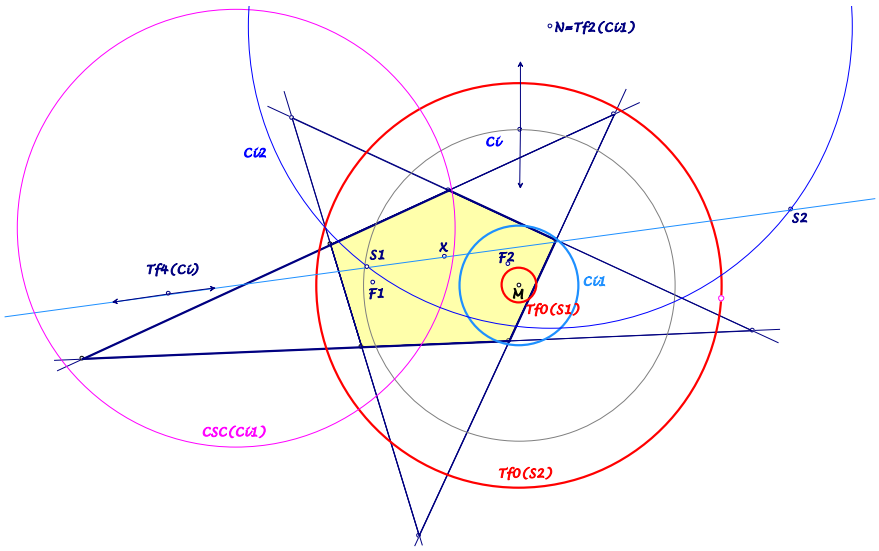
EQF-Note 2017-11-19

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

CSC-Circles for Points wrt a 5L

The CSC-images of a point wrt the 4L of a 5L are concyclic. These CSC-circles are special circles: For a given center there are two circles, which are CSC-circles. Here a construction is given.



Transformations

For a construction several transformations are used, already mentioned in earlier *QFG*-messages, up to now not in *EPG* (except *Tf1 = 5L-s-Tf1*):

Tf0 ***point → circle:*** The 5 *CSC*-images of a point *P* wrt the *4L* of a *5L* are concyclic on the circle *Tf0(P)*.

Tf1 ***point → point:*** *Tf1(P)* is the center of the circle *Tf0(P)* (see *5L-s-Tf1* in *EPG*).

Tf2 ***line/circle → point:*** Radical axes for the 5 *CSC*-images of a line/circle have a common point (see *QFG#780*).

Tf3 ***point → line:*** *Tf3(P)* is the radical axis of *Tf0(P)* and *5L-o-Ci1* (see *QFG#790*).

Tf4 ***line/circle → point:*** Radical axes for the *Tf0*-circles of the points of a line/circle have a common point (see *QFG#790*).

Further a point *X*:

$$\boldsymbol{X = F_1F_2^\circ \cap F_1^\circ F_2}.$$

F_1 and F_2 foci of the inscribed conic *5L-s-Co1*,
F_1° and F_2° inverses of F_1 and F_2 wrt *5L-o-Ci1*.

Construction

point *M*: Given center of the searched *CSC*-circles.

circle *Ci₁*: The two *CSC*-circles, centered in the given point *M* are inverse wrt a circle Ci_1 round *M* with radius $\sqrt{M.F_1 \times M.F_2}$.

line *L*: The *Tf4*-images of circles *Ci* round *M* give a line *L*, bearing point *X*.

circle *Ci₂*: Circle round $N = Tf2(Ci_1)$ orthogonal intersecting the circle $CSC(Ci_1)$ wrt any *4L* of the *5L*.

points *S₁, S₂*: Intersections of Ci_2 and *L*. $Tf0(S_1)$ and $Tf0(S_2)$ give the searched *CSC*-circles.

Background for the construction is the property of *CSC*-circles, that their *Tf2*- and *Tf4*-image points coincide.

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