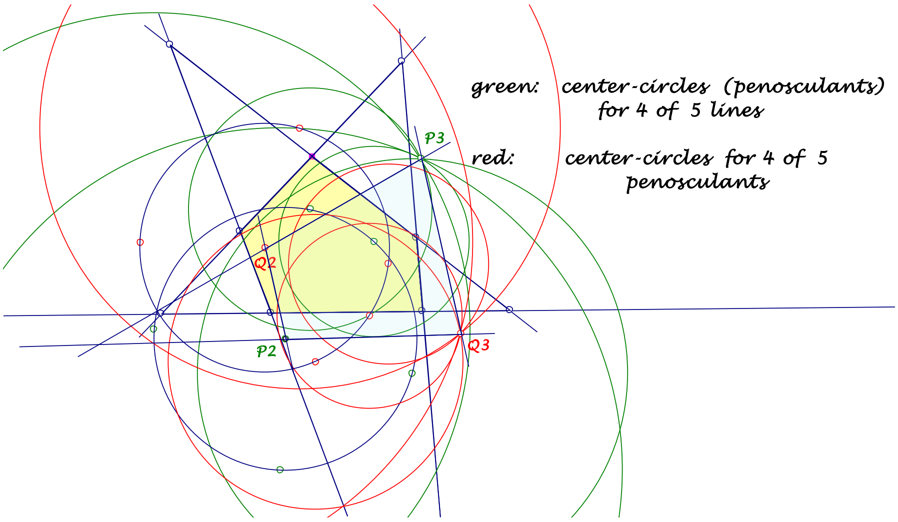
EQF-Note 2015-01-13

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

Line-Penosculant-Trapezoid of a n-Line

In his paper "On the metric geometry of the plane n-line" Morley describes penosculants of a n-line as center-circles for n-1 of n lines. In §5 he proved the center-circle theorem for penosculants. So there are center-circles for the n lines and for the corresponding n penosculants. Let P_2 / Q_2 be the center of the center-circle for n lines / n penosculants and analogous P_3 / Q_3 the common point of the n center-circles of n-1 lines / n-1 penosculants, then P_2Q_2 is parallel P_3Q_3.



Center-circle for n lines (§2):
A recursive definition begins with the circumcircle for 3 lines.
The center-circle for *n* lines is the circumcircle of the midpoints of the center-circles for *n-1* of *n* lines.

Center-circle for n penosculants (§5):
The center-circles for *n-1* of *n* lines are the considered *n* penosculants.
A recursive definition begins with the circumcircle for the 3 2^{nd} intersections of 3 penosculants.
The center-circle for *n* penosculants is the circumcircle of the midpoints of the center-circles for *n-1* of *n* penosculants.

Points:

P_2 center of the center-circle for *n* lines,

Q_2 center of the center-circle for *n* penosculants,

P_3 common point of the center-circles for n-1 of n lines,

Q_3 common point of the center-circles for n-1 of n penosculants.

Line-Penosculant-Trapezoid (n>4): P_2Q_2 is parallel P_3Q_3.

Final remark:

This constellation can be used for an involution with center in the intersection of P_2Q_3 and P_3Q_2 with partners P_2, P_3 or Q_2, Q_3.

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