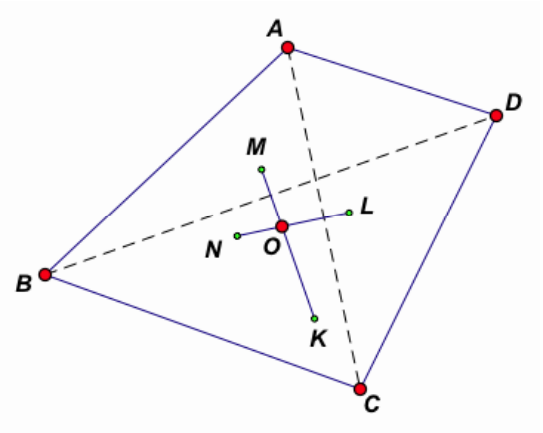
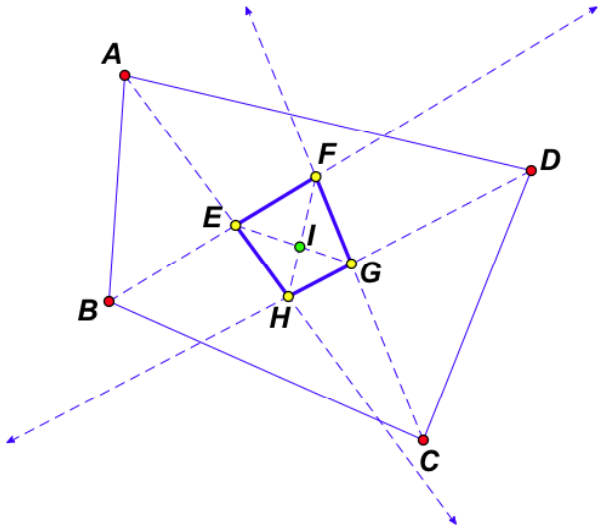
Proofs

Michael de Villiers, profmd@mweb.co.za



Proof Quasi-circumcentre

Since both *K* and *M* lie on the perpendicular bisector of the *BD*, all points on the line *KM* are equidistant from *B* and *D*. Similarly, all points on the line *LN* are equidistant from *A* and *C*. Thus, the intersection *O* of lines *KM* and *LN* is equidistant from the two pairs of opposite vertices.



Proof Quasi-incentre

Since *E* lies on angle bisectors of the angles *A* and *B*, it is equidistant from both *AD* and *BC*. Similarly, *G* is equidistant from *AD* and *BC*, and both *H* and *F* are equidistant from *AB* and *CD*. Hence, all points on the line *EG* are equidistant from *AD* and *BC*, and all points on the line *FH* are equidistant from *AB* and *CD*. Thus, the intersection *I* of *EG* and *HF* is equidistant from the two pairs of opposite sides.