

### Problem 24

The Feuerbach Point is the Perspector of the Euler Triangle and the Triangle of the External Centers of Similitude of the Incircles and the Circumcircles of the Corner Triangles of the Orthocenter

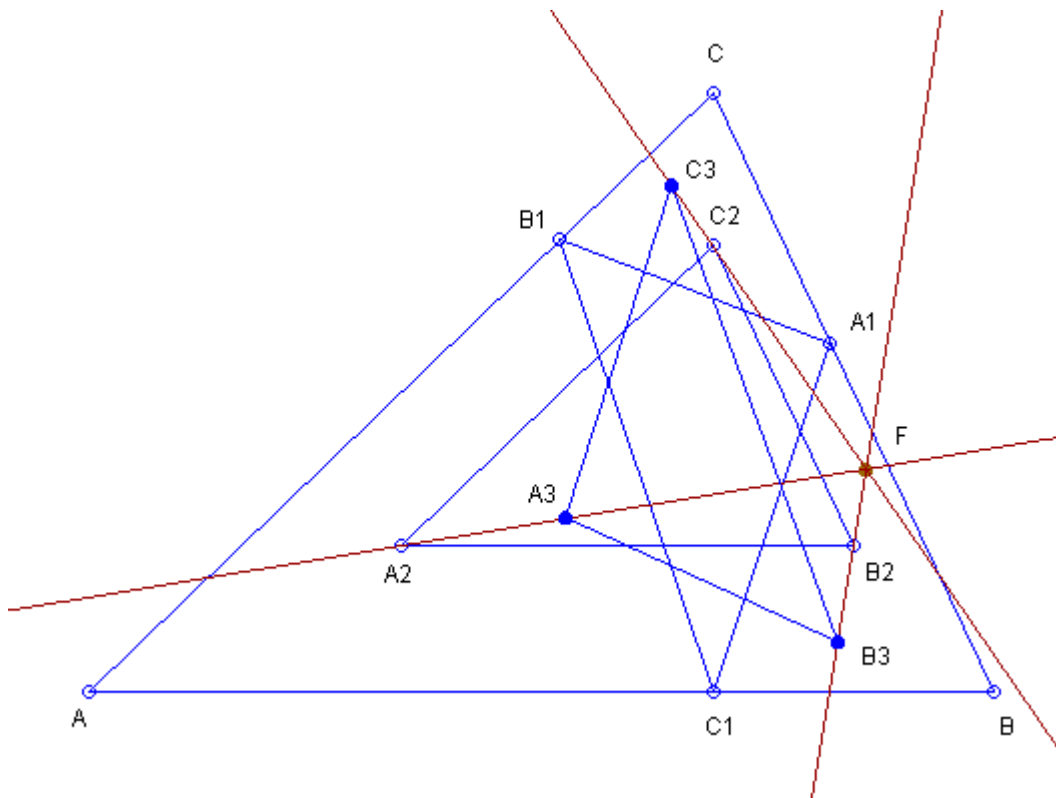
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Prove the following computer-generated theorem:

**THEOREM.** The Feuerbach Point is the Perspector of the Euler Triangle and the Triangle of the External Centers of Similitude of the Incircles and the Circumcircles of the Corner Triangles of the Orthocenter.

The reader may find the definitions in [1-4].

See the Figure:



$A_1B_1C_1$  - Orthic Triangle = Cevian Triangle of the Orthocenter;

$A_2B_2C_2$  - Euler Triangle;

$A_3$  - External Center of Similitude of the Incircle and the Circumcircle of triangle  $AB_1C_1$ ;

$B_3$  - External Center of Similitude of the Incircle and the Circumcircle of triangle  $BC_1A_1$ ;

$C_3$  - External Center of Similitude of the Incircle and the Circumcircle of triangle  $CA_1B_1$ ;

$A_3B_3C_3$  - Triangle of the External Centers of Similitude of the Incircles and the Circumcircles of the Corner Triangles of the Orthocenter;

The lines  $A_2A_3$ ,  $B_2B_3$ , and  $C_2C_3$  concur at the Feuerbach Point F, that is, the Feuerbach Point is the Perspector of the Euler Triangle and the Triangle of the External Centers of Similitude of the Incircles and the Circumcircles of the Corner Triangles of the Orthocenter.

## References

1. Quim Castellsaguer, The Triangles Web,  
<http://www.xtec.es/~qcastell/ttw/ttweng/portada.html>
2. D. Dekov, Computer-Generated Encyclopedia of Euclidean Geometry, First Edition, 2006, available at the Web: <http://www.dekovsoft.com/e1/>.
3. D. Dekov, papers in this journal, 2006, 2007, 2008.
4. Eric W. Weisstein, MathWorld - A Wolfram Web Resource.  
<http://mathworld.wolfram.com/>