

### Problem 33

The Feuerbach Point is the Homothetic Center of the Outer Yff Triangle and the Triangle of reflections of the Circumcenter in the vertices of the Medial Triangle

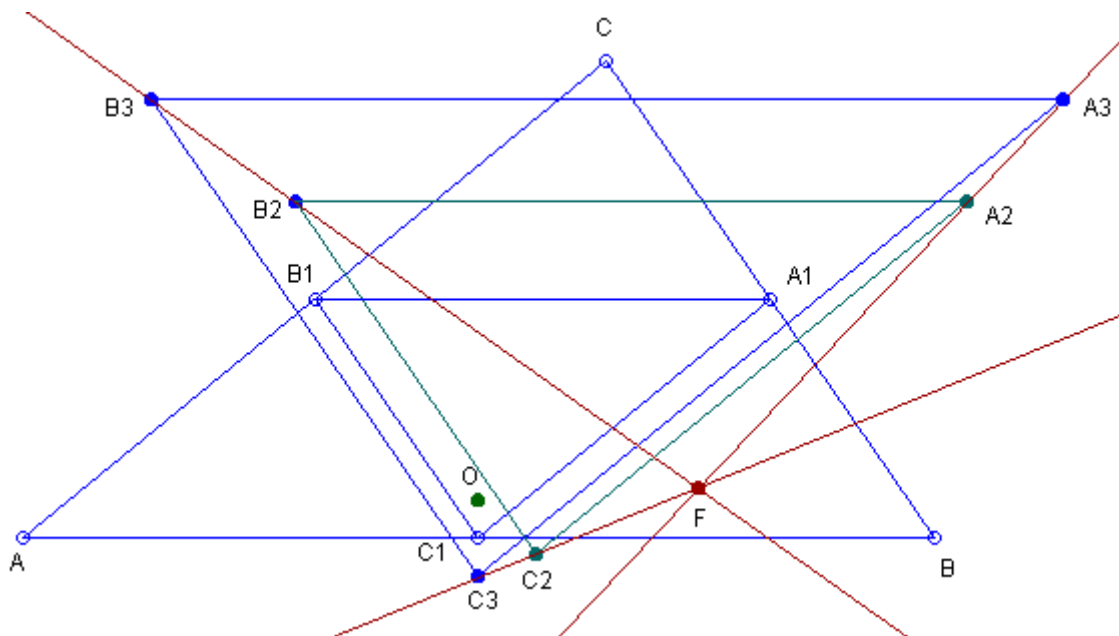
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Prove the following computer-generated theorem:

**THEOREM.** The Feuerbach Point is the Homothetic Center of the Outer Yff Triangle and the Triangle of reflections of the Circumcenter in the vertices of the Medial Triangle.

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

See the Figure:



$A_1B_1C_1$  - Medial Triangle = Cevian Triangle of the Centroid;

$A_2B_2C_2$  - Outer Yff Triangle;

O - Circumcenter;

$A_3$  - Reflection of the Circumcenter in  $A_1$ ;

$B_3$  - Reflection of the Circumcenter in  $B_1$ ;

$C_3$  - Reflection of the Circumcenter in  $C_1$ ;

$A_3B_3C_3$  - Triangle of reflections of the Circumcenter in the vertices of the Medial Triangle;  
The Feuerbach Point F is the Homothetic Center of the Outer Yff Triangle and the Triangle  
of reflections of the Circumcenter in the vertices of the Medial Triangle.

## 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/>