

## THE SMARANDACHE-PĂTRAȘCU THEOREM OF ORTHOHOMOLOGICAL TRIANGLES

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**The Smarandache-Pătrașcu Theorem of Orthohomological Triangles is the following:**

If  $P_1, P_2$  are isogonal points in the triangle  $ABC$ , and if  $A_1B_1C_1$  and  $A_2B_2C_2$  are their ponder triangle such that the triangles  $ABC$  and  $A_1B_1C_1$  are homological (the lines  $AA_1, BB_1, CC_1$  are concurrent), then the triangles  $ABC$  and  $A_2B_2C_2$  are also homological.

### **Proof**

It is known that the projections of the isogonal points on the sides of the triangle  $ABC$  are 6 concyclic points. Therefore  $A_1, A_2, B_1, B_2, C_1, C_2$  are concyclic (the *Circle of Six Points*).

It is also known the following:

Theorem: If in the triangle  $ABC$  the Cevianes  $AA_1, BB_1, CC_1$  are concurrent in the point  $F_1$  and the circumscribed circle to the triangle  $A_1B_1C_1$  intersects the sides of the triangle  $ABC$  in  $A_2, B_2, C_2$ , then the lines  $AA_2, BB_2, CC_2$  are concurrent in a point  $F_2$  (The Terquem's Theorem, in *Nouvelles Annales de Mathématiques*, de Terquem et Gérono, 1842).

### **Note**

The points  $F_1$  and  $F_2$  were named the Terquem's points by Candido from Pisa in 1900.

From these two theorems it results the theorem from above.

The homologic centers of the triangles  $ABC, A_1B_1C_1$  and  $ABC, A_2B_2C_2$  being the Terquem's Points in the triangle  $ABC$ .