

# RESEARCH GROUP IN MATHEMATICAL INEQUALITIES AND APPLICATIONS

## PROBLEM CORNER

### Problem 13, (2009)

**Jian Liu**

East China Jiaotong University  
Nanchang City, Jiangxi Province,  
330013, P.R. China

Email: 9sin9@163.com

Received: 11 October, 2009

---

**Conjecture:** Let  $P$  be a interior point of triangle  $ABC$  with radii  $r_a, r_b, r_c$  of excircles. If  $AP \cap BC = L, BP \cap CA = M, CP \cap AB = N$ , denote the altitudes of Cevian triangle  $LMN$  by  $h_l, h_m, h_n$ , then the following inequality

$$x^2 r_a + y^2 r_b + z^2 r_c \geq 2(yz h_l + zx h_m + xy h_n)$$

holds for all real numbers  $x, y, z$ .