RESEARCH GROUP IN MATHEMATICAL INEQUALITIES AND APPLICATIONS

PROBLEM CORNER

Problem 7, (2009)

Duy Khanh Nguyen

Students, Hanoi University of Science
334 Nguyen Trai Street, Thanh Xuan District
Hanoi, Vietnam

Email: duykhanhhus@gmail.com

Let a triangle ABC in plane. Denote ω is its Brocard angle. For $x, y, z \geq 0$ prove or disprove that:

$$\frac{y+z}{A} + \frac{z+x}{B} + \frac{x+y}{C} \geq \frac{\sqrt{3(xy+yz+zx)}}{\omega}$$

$$\frac{y+z}{A-\omega} + \frac{z+x}{B-\omega} + \frac{x+y}{C-\omega} \geq \frac{2\sqrt{3(xy+yz+zx)}}{\omega}$$

Note: All angles are measured in radians.