

# ROMANIAN MATHEMATICAL MAGAZINE

In  $\triangle ABC$  the following relationship holds:

$$\frac{h_a}{b} + \frac{h_b}{c} + \frac{h_c}{a} \leq \frac{3\sqrt{3}}{2}$$

*Proposed by Nguyen Hung Cuong – Vietnam*

*Solution by Daniel Sitaru – Romania*

$$\begin{aligned} \frac{h_a}{b} + \frac{h_b}{c} + \frac{h_c}{a} &= \sum_{cyc} \frac{h_a}{b} = \sum_{cyc} \frac{2F}{b} = 2F \sum_{cyc} \frac{1}{ab} = 2F \cdot \frac{a+b+c}{abc} = \\ &= 2F \cdot \frac{2s}{4RF} = \frac{s}{R} \stackrel{\text{MITRINOVICI}}{\leq} \frac{1}{R} \cdot \frac{3\sqrt{3}}{2} R = \frac{3\sqrt{3}}{2} \end{aligned}$$

Equality holds for  $a = b = c$ .