

# ROMANIAN MATHEMATICAL MAGAZINE

In  $\triangle ABC$  the following relationship holds:

$$\tan \frac{A}{2} \tan \frac{B}{2} = 1 - \frac{2r}{h_c}$$

*Proposed by Nguyen Hung Cuong-Vietnam*

*Solution by Daniel Sitaru-Romania*

$$\begin{aligned} \tan \frac{A}{2} \tan \frac{B}{2} &= \sqrt{\frac{(s-b)(s-c)}{s(s-a)}} \cdot \sqrt{\frac{(s-a)(s-c)}{s(s-b)}} = \\ &= \frac{s-c}{s} = 1 - \frac{c}{s} = 1 - \frac{\frac{F}{2F}}{\frac{s}{c}} \cdot 2 = 1 - \frac{2r}{h_c} \end{aligned}$$