ROMANIAN MATHEMATICAL MAGAZINE

In ΔABC the following relationship holds:

$$\frac{ab}{r_c^2}+\frac{bc}{r_a^2}+\frac{ac}{r_b^2}\geq 4$$

Proposed by Nguyen Hung Cuong-Vietnam

Solution by Mirsadix Muzefferov-Azerbaijan

$$\frac{ab}{r_c^2}+\frac{bc}{r_a^2}+\frac{ac}{r_b^2}\overset{AM-GM}{\geq} 3\left(\left(\frac{abc}{r_ar_br_c}\right)^2\right)^{\frac{1}{3}}=$$

$$=3\left(\left(\frac{4RF}{Fp}\right)^2\right)^{\frac{1}{3}}=3\left(\frac{16R^2}{p^2}\right)^{\frac{1}{3}}\overset{Mitrinovic}{\geq} 3\left(\frac{16}{p^2}.\frac{4p^2}{27}\right)^{\frac{1}{3}}=4$$

$$Equality\ \ holds\ \ for\ \ a=b=c.$$