ROMANIAN MATHEMATICAL MAGAZINE

In ΔABC the following relationship holds:

$$\sum_{cyc}\frac{bc}{m_a^2}\leq\frac{2R}{r}$$

Proposed by Kostantinos Geronikolas-Greece

Solution by Mirsadix Muzefferov-Azerbaijan

$$\sum_{cyc}\frac{bc}{m_a^2}\overset{Tereshin}{\leq}\sum_{cyc}\frac{16R^2bc}{(b^2+c^2)^2}\overset{AM-GM}{\leq}$$

$$\sum_{cyc}\frac{16R^2bc}{4b^2c^2}=4R^2.\sum_{cyc}\frac{1}{bc}=4R^2.\frac{a+b+c}{abc}=4R^2.\frac{2p}{4prR}=\frac{2R}{r}$$

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