ROMANIAN MATHEMATICAL MAGAZINE

$$If\ \ a,b,c>0\ \ and\ \ \ ab+bc+ac=3\ then\ prove\ that:$$

$$\frac{(2a+b+c)^3}{b+c}+\frac{(2b+a+c)^3}{a+c}+\frac{(2c+b+a)^3}{b+a}\geq 96$$

Proposed by Nguyen Hung Cuong-Vietnam

Solution by Mirsadix Muzefferov-Azerbaijan

$$\frac{(2a+b+c)^3}{b+c}+\frac{(2b+a+c)^3}{a+c}+\frac{(2c+b+a)^3}{b+a}\overset{HOLDER}{\geq}$$

$$=\frac{\left(4(a+b+c)\right)^3}{3.2(a+b+c)}=\frac{32(a+b+c)^2}{3}\geq\frac{32.3(ab+bc+ac)}{3}=96$$

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