

**PP45686**

MIHÁLY BENCZE - ROMANIA

If  $a, b, c, d > 0$  then:

$$\sum_{cyc} \frac{b+c+d}{(\sqrt{15(b+c+d)} + \sqrt{16a+b+c+d})^2} \geq \frac{3}{32}$$

*Solution by Daniel Sitaru, Claudia Nănuți.*

$$\begin{aligned} & \sum_{cyc} \frac{b+c+d}{(\sqrt{15(b+c+d)} + \sqrt{16a+b+c+d})^2} \geq \\ & \geq \sum_{cyc} \frac{b+c+d}{2(15b+15c+15d+16a+b+c+d)} = \\ & = \sum_{cyc} \frac{b+c+d}{2 \cdot 16(a+b+c+d)} = \\ & = \frac{1}{32(a+b+c+d)} \cdot \sum_{cyc} (b+c+d) = \\ & = \frac{1}{32(a+b+c+d)} \cdot 3 \sum_{cyc} a = \\ & = \frac{3(a+b+c+d)}{32(a+b+c+d)} = \frac{3}{32} \end{aligned}$$

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

□

MATHEMATICS DEPARTMENT, NATIONAL ECONOMIC COLLEGE "THEODOR COSTESCU", DROBETA  
TURNU - SEVERIN, ROMANIA

*Email address:* dansitaru63@yahoo.com