

PP34336

MIHÁLY BENCZE - ROMANIA

In all acute triangle ABC holds:

$$(2^{\sin A} + 2^{\cos A})(2^{\sin B} + 2^{\cos B})(2^{\sin C} + 2^{\cos C}) > 8^{1-\frac{1}{\sqrt{2}}}$$

Solution by Daniel Sitaru.

$$\begin{aligned} \prod_{cyc} (2^{\sin A} + 2^{\cos A}) &\stackrel{\text{AM-GM}}{\geq} 8 \prod_{cyc} \sqrt{2^{\sin A + \cos A}} = 8 \prod_{cyc} \sqrt{2^{\sqrt{2} \sin(A + \frac{\pi}{4})}} > \\ &> 8 \prod_{cyc} \sqrt{2^{-\sqrt{2}}} = 8 \cdot 2^{\frac{-3\sqrt{2}}{2}} = 8^{1-\frac{1}{\sqrt{2}}} \end{aligned}$$

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