

PP45684

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

$$\sum_{cyc} \frac{a+b}{(\sqrt{47(a+b)} + \sqrt{a+b+48c})^2} \geq \frac{1}{48}$$

Solution by Daniel Sitaru, Claudia Nănuți.

$$\begin{aligned} & \sum_{cyc} \frac{a+b}{(\sqrt{47(a+b)} + \sqrt{a+b+48c})^2} \geq \\ & \geq \sum_{cyc} \frac{a+b}{2(47a+47b+a+b+48c)} = \\ & = \sum_{cyc} \frac{a+b}{2 \cdot 48(a+b+c)} = \\ & = \frac{1}{96(a+b+c)} \sum_{cyc} (a+b) = \\ & = \frac{1}{96(a+b+c)} \cdot (a+b+b+c+c+a) = \\ & = \frac{2(a+b+c)}{96(a+b+c)} = \frac{1}{48} \end{aligned}$$

Equality holds for $a = b = c$.

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