

# ROMANIAN MATHEMATICAL MAGAZINE

In acute  $\triangle ABC$  the following relationship holds:

$$\sum_{cyc} w_a (\cot A - \cot B) \geq 0$$

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$$\text{WLOG: } a \leq b \leq c \Rightarrow \begin{cases} w_a \geq w_b \geq w_c \\ \cot A \geq \cot B \geq \cot C \end{cases}$$

By rearrangements' inequality:

$$w_a \cot A + w_b \cot B + w_c \cot C \geq w_a \cot B + w_b \cot C + w_c \cot A$$

$$w_a (\cot A - \cot B) + w_b (\cot B - \cot C) + w_c (\cot C - \cot A) \geq 0$$

$$\sum_{cyc} w_a (\cot A - \cot B)$$

Equality holds for  $a = b = c$ .