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In acute ΔABC the following relationship holds:

$$\cot A \cdot \cot B \cdot \cot C \geq \frac{(s-r-2R)(s+r+2R)}{Rs}$$

Proposed by Florică Anastase-Romania

Solution by Soumava Chakraborty-Kolkata-India

$$\prod \cot A = \frac{\prod \cos A}{\prod \sin A} = \frac{\frac{s^2-(2R+r)^2}{4R^2}}{\frac{abc}{8R^3}}$$

$$= \frac{(s-r-2R)(s+r+2R)}{4R^2} \cdot \frac{8R^3}{4Rrs} = \frac{(s-r-2R)(s+r+2R)}{2rs}$$

$$\overset{Euler}{\geq} \frac{(s-r-2R)(s+r+2R)}{Rs}$$

$\because (s-r-2R)(s+r+2R) > 0$ ***as*** $\prod \cos A = \frac{s^2-(2R+r)^2}{4R^2} > 0$ ***as*** ΔABC ***is acute***

Proved