# ROMANIAN MATHEMATICAL MAGAZINE

**In $\Delta ABC$ the following relationship holds:**

$$\sqrt[2026]{\sin A}+\sqrt[2026]{\sin B}+\sqrt[2026]{\sin C}\le \sqrt[2026]{\cos\frac{A}{2}}+\sqrt[2026]{\cos\frac{B}{2}}+\sqrt[2026]{\cos\frac{C}{2}}$$

***Proposed by Nguyen Hung Cuong-Vietnam***

***Solution by Tapas Das-India***

$$\sin A+\sin B=2\sin\frac{A+B}{2}.\cos\frac{A-B}{2}\overset{A+B+C=\pi\ \&\ \cos\frac{A-B}{2}\le 1}{\le}2\cos\frac{C}{2}$$

$$\sqrt[2026]{\sin A}+\sqrt[2026]{\sin B}\overset{CBS}{\le}2\sqrt[2026]{\left(\frac{\sin A+\sin B}{2}\right)}\le 2\sqrt[2026]{\left(\frac{2\cos\frac{C}{2}}{2}\right)}=$$

$$=2\sqrt[2026]{\cos\frac{A}{2}}\ then\ \sqrt[2026]{\cos\frac{A}{2}}\ge\frac{1}{2}\left(\sqrt[2026]{\sin A}+\sqrt[2026]{\sin B}\right)$$

$$\sqrt[2026]{\cos\frac{A}{2}}+\sqrt[2026]{\cos\frac{B}{2}}+\sqrt[2026]{\cos\frac{C}{2}}\ge\frac{1}{2}\sum\left(\sqrt[2026]{\sin A}+\sqrt[2026]{\sin B}\right)=$$

$$=\sqrt[2026]{\sin A}+\sqrt[2026]{\sin B}+\sqrt[2026]{\sin C}$$

**Equality holds for an equilateral triangle.**