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In ΔABC the following relationship holds:

$$\left(\sec\frac{A}{2}\right)^{\sec\frac{A}{2}}\left(\sec\frac{B}{2}\right)^{\sec\frac{B}{2}}\left(\sec\frac{C}{2}\right)^{\sec\frac{C}{2}}\geq\left(\frac{2}{\sqrt{3}}\right)^{2\sqrt{3}}$$

Proposed by Nguyen Hung Cuong-Vietnam

Solution by Tapas Das-India

$$\sum\sec\frac{A}{2}\overset{Jensen}{\geq}3\sec\left(\frac{A+B+C}{6}\right)=3\sec\frac{\pi}{6}=2\sqrt{3}(1)$$

$$\left(\sec\frac{A}{2}\right)^{\sec\frac{A}{2}}\left(\sec\frac{B}{2}\right)^{\sec\frac{B}{2}}\left(\sec\frac{C}{2}\right)^{\sec\frac{C}{2}}\overset{Weigted\ HM\leq GM}{\geq}$$

$$\geq\left(\frac{\sum\sec\frac{A}{2}}{\sum\frac{\sec\frac{A}{2}}{\sec\frac{A}{2}}}\right)^{\sum\sec\frac{A}{2}}\overset{(1)}{\geq}\left(\frac{2\sqrt{3}}{3}\right)^{2\sqrt{3}}=\left(\frac{2}{\sqrt{3}}\right)^{2\sqrt{3}}$$

Equality holds for an equilateral triangle.