In $\triangle ABC$ the following relationship holds:

$$\frac{a}{b\left(\sin\frac{A}{2}+\sin\frac{B}{2}\right)+c\sin\frac{C}{2}}+\frac{b}{c\left(\sin\frac{A}{2}+\sin\frac{B}{2}\right)+a\sin\frac{C}{2}}+\frac{c}{a\left(\sin\frac{A}{2}+\sin\frac{B}{2}\right)+b\sin\frac{C}{2}}\geq 2$$

Proposed by Zaza Mzhavanadze-Georgia

Solution by Tapas Das-India

$$Note:\sum\sin\frac{A}{2}\overset{Jensen}{\leq}3\sin\left(\frac{A+B+C}{6}\right)=3\sin\frac{\pi}{6}=\frac{3}{2}\ (1)$$

$$\frac{a}{b\left(\sin\frac{A}{2}+\sin\frac{B}{2}\right)+c\sin\frac{C}{2}}+\frac{b}{c\left(\sin\frac{A}{2}+\sin\frac{B}{2}\right)+a\sin\frac{C}{2}}+\frac{c}{a\left(\sin\frac{A}{2}+\sin\frac{B}{2}\right)+b\sin\frac{C}{2}}\geq 2$$

$$or\ \sum\frac{a}{b\left(\sin\frac{A}{2}+\sin\frac{B}{2}\right)+c\sin\frac{C}{2}}=\sum\frac{a^2}{ab\left(\sin\frac{A}{2}+\sin\frac{B}{2}\right)+ca\sin\frac{C}{2}}\overset{Bergstrom}{\geq}$$

$$\geq\frac{(a+b+c)^2}{(\sum ab)\left(\sum\sin\frac{A}{2}\right)}\overset{3\sum ab\leq(\sum a)^2}{\geq}\frac{(\sum a)^2}{\left(\frac{(\sum a)^2}{3}\right)\left(\frac{3}{2}\right)}\left(using\,(1)\right)=2$$

Equality for $a=b=c$