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In ΔABC the following relationship holds:

$$\sum h_a \sum \frac{1}{r_a} \leq \sum r_a \sum \frac{1}{h_a}$$

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Solution by Tapas Das-India

$$We\ know\ that \sum \frac{1}{h_a} = \sum \frac{1}{r_a} = \frac{1}{r}\ (1)$$

$$We\ need\ to\ show$$

$$\sum h_a \sum \frac{1}{r_a} \leq \sum r_a \sum \frac{1}{h_a} or, \sum h_a \overset{(1)}{\leq} \sum r_a$$

$$or \sum m_a \overset{m_a \geq h_a}{\leq} .4R + r$$

$$(which\ is\ true\ by\ Leunberger\ inquality)$$

$$Equality\ holds\ for\ equilateral\ triangle$$