RESEARCH GROUP IN
MATHEMATICAL INEQUALITIES
AND APPLICATIONS

PROBLEM CORNER

Problem 5, (2009)

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Let an arbitrary $\triangle ABC$ be in a plane which has circumradius R and inradius r. Denote by w_a, w_b, w_c; h_a, h_b, h_c three internal bisectors and three altitudes from vertex A, B, C respectively.
Prove or disprove that

$$\frac{w_a}{h_a} + \frac{w_b}{h_b} + \frac{w_c}{h_c} \geq \sqrt{\frac{4R}{r} + 1}$$