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S.2391 In $\triangle ABC$ the following relationship holds:

$$(2a + b)(2c + b) + (2b + c)(2a + c) + (2c + a)(2b + a) \leq 81R^2$$

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The given inequality is equivalent to:

$$a^2 + b^2 + c^2 + 8(ab + bc + ca) \leq 81R^2,$$

which follows by $a^2 + b^2 + c^2 \leq 9R^2$ (item 5. 13 from [1]) and $ab + bc + ca \leq 9R^2$ (item 5. 16 from [1]).

[1] O. Bottema, *Geometric Inequalities*, Groningen 1969