Mathematical
Inequalities
& Applications
Volume 5, Number 4 (2002), 745–751

# GENERAL POWER INEQUALITIES BETWEEN THE SIDES AND THE CIRCUMSCRIBED AND INSCRIBED RADII RELATED TO THE FUNDAMENTAL TRIANGLE INEQUALITY

RAZVAN ALIN SATNOIANU

*Abstract.* In this paper we establish the following general triangle inequality between the lengths of its sides $\alpha$, $\beta$, $\gamma$, and the circumscribed and inscribed radii $R$ and $r$, respectively:

$$\alpha^n + \beta^n + \gamma^n \leqslant 2^{n+1}R^n + 2^n\left(3^{1+\frac{n}{2}} - 2^{n+1}\right)r^n \quad \text{for any} \quad n \geqslant 0.$$

This result extends to the general case the results previously known for $n = 1, 2$ established by W. Blundon [2,3]. Our inequality also extends the fundamental triangle inequality.

*Mathematics subject classification* (2000): 51M16.
*Key words and phrases*: geometric triangle inequalities, fundamental triangle inequality, principle of the isosceles triangle.

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Paper MIA-05-75