

# RESEARCH GROUP IN MATHEMATICAL INEQUALITIES AND APPLICATIONS

## PROBLEM CORNER

### Problem 9, (2009)

**Jian Liu**

East China Jiaotong University  
Nanchang City, Jiangxi Province,  
330013, P.R. China

Email: 9sin9@163.com

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**Conjecture.** Let  $x_1, x_2, \dots, x_n, y_1, y_2, \dots, y_n$  be positive real numbers and let  $p \geq 1, q \geq 1$ . Then

$$\sum_{i=1}^n \frac{(x_i^{p+1} + x_{i+1}^{p+1})(y_i^{q+1} + y_{i+1}^{q+1})}{(x_i^p + x_{i+1}^p)(y_i^q + y_{i+1}^q)} \geq \frac{1}{n^2} \sum_{i=1}^n x_i \sum_{i=1}^n y_i$$

where  $x_{n+1} = x_1, y_{n+1} = y_1$ . If  $p \leq -1, q \leq -1$ , then the above inequality is reversed.