

# Research Group in Mathematical Inequalities and Applications

$$v(G) > \sum_{m \in G} v(m)$$

*The value of the Group is greater than  
the sum of the values of its members.*

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## Problem Corner

### Problem 6, (2010)

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Let  $f : I \subseteq \mathbb{R} \rightarrow \mathbb{R}_+$  be a continuous mapping defined on the interval  $I$  of real numbers and  $a, b \in I$ , with  $a < b$ . Prove that the following inequality holds:

$$(1) \quad \frac{1}{2} \int_a^b \frac{f(u)}{\sin^{-1}\left(\sqrt{\frac{u-a}{b-a}}\right)} du < \int_a^b \frac{f(u)}{\sqrt{(u-a)(b-u)}} du \leq \frac{\pi}{4} \int_a^b \frac{f(u)}{\sin^{-1}\left(\sqrt{\frac{u-a}{b-a}}\right)} du$$

for all  $a < u < b$ .