

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.*

Problem Corner

Problem 2, (2010), Solution No. 2

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Solution: Since $f'' \geq 0$, for $s \leq t$,

$$\frac{\partial}{\partial s} F(s, t) = f'(s) - f'\left(\frac{s+t}{2}\right) \leq 0.$$

We obtain for $a \leq s \leq t$,

$$F(a, t) \geq F(s, t).$$

Since $f'' \geq 0$, for $s \leq t$,

$$\frac{\partial}{\partial t} F(s, t) = f'(t) - f'\left(\frac{s+t}{2}\right) \geq 0.$$

We obtain for $s \leq t \leq b$,

$$F(s, t) \leq F(s, b).$$

So we get for $a \leq s \leq t \leq b$,

$$F(s, t) \leq F(a, b).$$

Since $F(s, t) = F(t, s)$,

$$\max_{s, t \in I} F(s, t) = \max_{a \leq s \leq t \leq b} F(s, t) = F(a, b).$$