

PP46657

MIHÁLY BENCZE - ROMANIA

If $a, b, c > 0$ then:

$$\sum_{cyc} a^2b + \sum_{cyc} a \geq 2 \sum_{cyc} ab$$

Solution by Daniel Sitaru.

$$(1) \quad a^2b + b \stackrel{\text{AM-GM}}{\geq} 2\sqrt{a^2b \cdot b} = 2ab$$

$$(2) \quad b^2c + c \stackrel{\text{AM-GM}}{\geq} 2\sqrt{b^2c \cdot c} = 2bc$$

$$(3) \quad c^2a + a \stackrel{\text{AM-GM}}{\geq} 2\sqrt{c^2a \cdot a} = 2ca$$

By adding (1); (2); (3):

$$\sum_{cyc} a^2b + \sum_{cyc} a \geq 2 \sum_{cyc} ab$$

Equality holds for $a = b = c = 1$.

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