Problema săptămânii 186

Arătaţi că dacă $x_1, x_2, \ldots, x_9 > 0$, atunci are loc inegalitatea

$$\frac{x_1 - x_3}{x_1x_3 + 2x_2x_3 + x_2^2} + \frac{x_2 - x_4}{x_2x_4 + 2x_3x_4 + x_3^2} + \ldots + \frac{x_8 - x_1}{x_8x_1 + 2x_9x_1 + x_9^2} + \frac{x_9 - x_2}{x_9x_2 + 2x_1x_2 + x_1^2} \geq 0.$$

Problem of the week no. 186

Prove that, for all $x_1, x_2, \ldots, x_9 > 0$, the following inequality holds:

$$\frac{x_1 - x_3}{x_1x_3 + 2x_2x_3 + x_2^2} + \frac{x_2 - x_4}{x_2x_4 + 2x_3x_4 + x_3^2} + \ldots + \frac{x_8 - x_1}{x_8x_1 + 2x_9x_1 + x_9^2} + \frac{x_9 - x_2}{x_9x_2 + 2x_1x_2 + x_1^2} \geq 0.$$