



Kurschak Competition 1975

www.artofproblemsolving.com/community/c3174940

by parmenides51

- 1 Transform the equation

$$ab^2 \left(\frac{1}{(a+c)^2} + \frac{1}{(a-c)^2} \right) = (a-b)$$

into a simpler form, given that $a > c \geq 0, b > 0$.

- 2 Prove or disprove: given any quadrilateral inscribed in a convex polygon, we can find a rhombus inscribed in the polygon with side not less than the shortest side of the quadrilateral.
-

- 3 Let

$$x_0 = 5, \quad x_{n+1} = x_n + \frac{1}{x_n}.$$

Prove that $45 < x_{1000} < 45.1$.
