MathLovers

Problems – 08/14/2025

The solutions to the problems below
will be published on Monday 08/18/2025

Problem 1. Let the quadrilateral $ABDC$ be inscribed in a circle, and let X be the intersection point of its diagonals. Prove that

$$AB \cdot AC < AX \cdot (BC + AD).$$

Problem 2. An infinite sequence $a_1, a_2, \ldots$ of positive integers will be called *bulldozer* if it satisfies the condition

$$a_i \mid a_j \iff j \mid i$$

for every pair of positive integers (i, j). Determine whether a bulldozer sequence exists.

Good Luck!

We encourage you to submit your solutions via the website:
`https://mathlovers.eu/submit-solution/`!