



Problems – 11/20/2025
The solutions to the problems below
will be published on Sunday 11/23/2025

Problem 1. Prove that every integer can be represented in the form $\pm 1^2 \pm 2^2 \pm \dots \pm k^2$ for some $k > 1$ and some choice of signs.

Problem 2. For sets X, Y of integers we define $X - Y = \{x - y \mid x \in X, y \in Y\}$. Given are sets A, B, C of integers. Prove the inequality

$$|A - B| \cdot |A - C| \geq |A| \cdot |B - C|.$$

Good Luck!

We encourage you to submit your solutions via the website:

<https://mathlovers.eu/submit-solution/>!