## Six standard deviations suffice

by Y. Demidovich, group 305, English teacher: A. A. Savchenko

- 1. The problem under consideration is combinatorial and deals with arbitrary finite sets and coloring of their elements. It shows that there exists a two-coloring of 'n' elements, such that 'n' given sets on these elements have a maximum discrepancy of  $Kn^{1/2}$ .
- 2. The main result formulated in the language of linear forms suddenly yields two corollaries relevant to set theory and classical Fourier analysis, respectively.
- 3. The proof of the main theorem is based on the probabilistic method, Paul Erdös being regarded as its inventor.
- 4. Another interesting application of the main theorem is to the János Komlós Conjecture. Although it strongly supports the conjecture, it falls short of being a complete and conclusive proof.
- 5. It is important to prove that the main theorem is "best possible" up to the constant factor, i.e. to show that the best asymptotic is obtained.
- 6. The main theorem is valid up to a moderate value of the constant K, with K = 5.32.

English teacher: \_\_\_\_\_/ A. Savchenko