

# HOMOLOGICAL METHODS IN OLYMPIAD MATHEMATICS

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## ABSTRACT

**MOTIVATING PROBLEM** (Baltic Way 2018). On a  $16 \times 16$  torus as shown all 512 edges are colored red or blue. A coloring is good if every vertex is an endpoint of an even number of red edges. A move consists of switching the color of each of the 4 edges of an arbitrary cell. What is the largest number of good colorings such that none of them can be converted to another by a sequence of moves?

