

ARE ALMOST ALL  $n$ -VERTEX GRAPHS  
OF GIVEN DIAMETER HAMILTONIAN?T.I. FEDORYAEVA *Представлено П.П. ПЕТРОВЫМ*

**Abstract:** Typical Hamiltonian properties of the class of  $n$ -vertex graphs of a fixed diameter  $k$  are studied. A new class of typical  $n$ -vertex graphs of a given diameter is constructed.

The question of S.V. Avgustinovich on the Hamiltonian property of almost all such  $n$ -vertex graphs has been solved. It is proved that almost all  $n$ -vertex graphs of fixed diameter  $k = 1, 2, 3$  are Hamiltonian, while almost all  $n$ -vertex graph of fixed diameter  $k \geq 4$  are nonHamiltonian graphs. All found typical Hamiltonian properties of  $n$ -vertex graphs of a fixed diameter  $k \geq 1$  are also typical for connected graphs of diameter at least  $k$ , as well as for graphs (not necessarily connected) containing the shortest path of length at least  $k$ .

**Keywords:** graph, Hamiltonian graph, Hamiltonian cycle, diameter, typical graphs, almost all graphs.

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FEDORYAEVA, T.I., ARE ALMOST ALL  $n$ -VERTEX GRAPHS OF GIVEN DIAMETER HAMILTONIAN?

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The work was performed according to the Government research assignment for IM SB RAS, project FWNF-2022-0017.

*Received December, 1, 2024, published December, 1, 2024.*