A graph $G$ is called $k$-distance-transitive iff for every two pairs $(x_1, x_2), (y_1, y_2)$ of vertices with distances $d(x_1, x_2) = d(y_1, y_2) \leq k$ there is an automorphism of the graph $G$ mapping $x_1$ to $y_1$ and $x_2$ to $y_2$. Graphs that are $k$-distance-transitive for all $k \in \mathbb{N}$ are called distance-transitive graphs.

The main result is the following theorem: Let $G$ be a connected infinite graph with more than one end. Then the following properties are equivalent:

(i) $G$ is distance-transitive;

(ii) $G$ is 2-distance-transitive;

(iii) $G \cong X_{\kappa, \lambda}$ for $\kappa, \lambda \geq 2$ (where $X_{\kappa, \lambda}$ denotes the infinite graph of connectivity 1 such that each block is a complete graph on $\kappa$ vertices and every vertex lies in $\lambda$ distinct blocks).

Moreover, the authors consider infinite graphs with the property that the existence of an isomorphism between two finite induced subgraphs implies the existence of a graph automorphism mapping one of the subgraphs to the other.

Reviewer: Ulrike Baumann (Dresden)

MSC:

05C25 Graphs and abstract algebra (groups, rings, fields, etc.)
05C63 Infinite graphs
05C60 Isomorphism problems in graph theory (reconstruction conjecture, etc.) and homomorphisms (subgraph embedding, etc.)
05C12 Distance in graphs

Keywords: $k$-distance transitive graph; distance transitive graph; infinite graph of connectivity 1

Full Text: DOI arXiv Link

References:


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