

СИБИРСКИЕ ЭЛЕКТРОННЫЕ
МАТЕМАТИЧЕСКИЕ ИЗВЕСТИЯ

Siberian Electronic Mathematical Reports

<http://semr.math.nsc.ru>

Том 19, № 2, стр. 144–144 (2022)

УДК 519.173+519.175

DOI 10.33048/semi.2022.19.xxx

MSC 05C12+05C80

LOGARITHMIC ASYMPTOTICS
OF THE NUMBER OF CENTRAL VERTICES
OF ALMOST ALL n -VERTEX GRAPHS OF DIAMETER k

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ABSTRACT. The asymptotic behavior of the number of central vertices and F. Buckley's central ratio $\mathbb{R}_c(G) = |\mathbb{C}(G)|/|V(G)|$ for almost all n -vertex graphs G of fixed diameter k is investigated.

The logarithmic asymptotics of the number of central vertices for almost all such n -vertex graphs is established: 0 or $\log_2 n$ (1 or $\log_2 n$), respectively, for arising here subclasses of graphs of the even (odd) diameter.

It is proved that for almost all n -vertex graphs of diameter k , $\mathbb{R}_c(G) = 1$ for $k = 1, 2$, and $\mathbb{R}_c(G) = 1 - 2/n$ for graphs of diameter $k = 3$, while for $k \geq 4$ the value of the central ratio $\mathbb{R}_c(G)$ is bounded by the interval $(\frac{\Delta}{6} + r_1(n), 1 - \frac{\Delta}{6} - r_1(n))$ except no more than one value (two values) outside the interval for even diameter k (for odd diameter k) depending on k . Here $\Delta \in (0, 1)$ is arbitrary predetermined constant and $r_1(n), r_2(n)$ are positive infinitesimal functions.

Keywords: graph, diameter, radius, central vertices, number of central vertices, central ratio, center, spectrum of center, typical graphs, almost all graphs.

FEDORYAEVA, T.I., LOGARITHMIC ASYMPTOTICS OF THE NUMBER OF CENTRAL VERTICES OF ALMOST ALL n -VERTEX GRAPHS OF DIAMETER k .

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The work was carried out within the framework of the state contract of the Sobolev Institute of Mathematics (project no. FWNF-2022-0018).

Received May, 11, 2022, published May, , 2022.