

ON THE B-CHROMATIC NUMBER OF REGULAR GRAPHS

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The b-chromatic number of a graph G is the largest integer k such that G admits a proper k -coloring in which every color class contains at least one vertex that has a neighbor in each of the other color classes. We prove that every d -regular graph with at least $2d^3$ vertices has b-chromatic number $d + 1$, that the b-chromatic number of an arbitrary d -regular graph with girth $g = 5$ is at least $\left\lfloor \frac{d+1}{2} \right\rfloor$ and that every d -regular graph, $d \geq 6$, with diameter at least d and with no 4-cycles has b-chromatic number $d + 1$.

Keywords: b-chromatic number, size, girth, diameter.

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