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ON UNIQUELY VERTEX-k-COLORABILITY OF GRAPHS

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Abstract

Let a graph $G = (V, E)$ will refer to vertex set V with $|V| = n = n(G)$ and edge set E with $|E| = e = e(G)$ if G has a unique coloring with say t colors, then, in fact $t = \chi(G)$, where $\chi(G)$ is the chromatic number of G, that is, the smallest positive integer S for which there is a coloring of G using exactly s colors. A function $\phi : V(G) \to V(G')$ is said to be a homomorphism of the graph G into the graph G' if it preserves adjacency of vertices, that is, if $\{x, y\} \in E(G)$ implies $\{\phi(x), \phi(y)\} \in E(G')$. Then ϕ is said to be homomorphism of G onto G' and G' is said to be a homomorphic image of G. In this paper we discuss about the uniquely vertex colorable graphs, sufficient condition for determining unique vertex colorability and complexity results for unique coloring.

Key Words : *Color classes, Critical graphs, Triangulation, Homomorphic image, Induced subgraphs.*