

Complete Tripartite Graphs with Spanning Maximal Planar Subgraphs

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Abstract : A simple graph is planar if there is a way of drawing it in the plane without edge crossings. A planar graph which is not a proper spanning subgraph of another planar graph is a maximal planar graph. We prove that for complete tripartite graphs of order at most 9, the only ones that contain a spanning maximal planar subgraph are $K_{1,1,1}$, $K_{2,2,2}$, $K_{2,3,3}$, and $K_{3,3,3}$. The main result gives a necessary and sufficient condition for the complete tripartite graph $K_{x,y,z}$ to contain a spanning maximal planar subgraph.

Keywords : complete tripartite graph, graph, maximal planar graph, planar graph, subgraph

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