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On Unimodular Graphs

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We study unimodular graphs, i.e. graphs whose adjacency matrices have determinant equal to 1 or -1. Some constructions are given for such graphs, and certain subclasses of these graphs are characterized. Graphs whose adjacency matrices are totally unimodular are characterized. We also focus on the bipartite graphs having a unique perfect matching. For such graphs, we provide a formula for the inverse of the corresponding adjacency matrix. It is shown that for every graph G of order n if $\det(G) = 1$, then n is divisible by 4, while if $\det(G) = -1$, then n is congruent to 2 mod 4, where $\det(G)$ denotes the determinant of the adjacency matrix of G.