

Characterizing and recognizing exact squares of graphs

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For a graph $G = (V, E)$, its exact square is the graph with vertex set V and an edge between vertices x and y if and only if x and y are at distance exactly two in G . We characterize graphs which are the exact square of some graph, in a way that leads to a polynomial time recognition algorithm. This contrasts with what is known for usual graph squares. We also study graphs which have a bipartite exact root, or a tree exact root, obtaining two more results which contrast with the literature on usual squares.

Keywords: graph exact square, graph square, graph recognition