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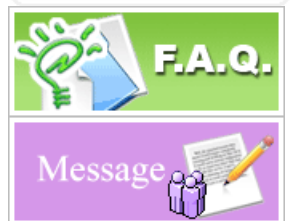
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On the Connectedness of Square Element Graphs over Arbitrary Rings

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Abstract. In this paper, we continue our study of the square element graph which is defined as follows: if R is a ring then the square element graph $\mathbb{S}q(R)$ is the simple undirected graph whose vertex set consists of all non-zero elements of R , and two vertices u, v are adjacent if and only if $u + v = x^2$ for some $x \in R - \{0\}$. Here we mainly consider the connectedness of $\mathbb{S}q(R)$ over different rings. We particularly look at $\mathbb{S}q(R)$ taken over some infinite rings which contain \mathbb{Z} as a subring. For a ring R and an ideal I of R , the relation between the connectedness of $\mathbb{S}q(R)$ and $\mathbb{S}q(R/I)$ is studied. Finally, connectedness of $\mathbb{S}q(R)$ over various polynomial rings and matrix rings are considered.

Keywords: Square element graph; Infinite graph; Connectedness; Diameter.