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An Investigation of properties of prime graph of non-commutative rings

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Let $PG(R)$be the prime graph of the ring$R$ in which, the vertices are the elements of the ring R and edges represent the set, $E = \{\overline{xy}|xy = 0\ or\ yx = 0,\ x \neq y \text{ and } x, y \in R\}$ while $\Gamma(R)$denotes the zero divisor graph with the set of nonzero zero-divisors of *R*, and for distinct $x, y \in Z(R)^*$, the vertices are adjacent if and only if $xy = 0$. In this work, we investigate some properties of the zero divisor graphs and prime graphs. Also, we find the chromatic number, the minimum number of colors that can be used to color the vertices of a graph such that no two adjacent vertices are assigned the same color, of the prime graph of some non-commutative rings.

Keywords: Prime graph, prime ring, zero divisor graph, chromatic number

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