

ON THE GENUS OF THE IDEMPOTENT GRAPH OF A FINITE COMMUTATIVE RING

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Abstract

Let R be a finite commutative ring with identity. The *idempotent graph* of R is the simple undirected graph $I(R)$ with vertex set, the set of all non-trivial idempotents of R and two distinct vertices x and y are adjacent if and only if $xy = 0$. In this paper, we have determined all isomorphism classes of finite commutative rings with identity whose $I(R)$ has genus one or two. Also we have determined all isomorphism classes of finite commutative rings with identity whose $I(R)$ has crosscap one. Also we study the the book embedding of toroidal idempotent graphs and classify finite commutative rings whose $I(R)$ is a ring graph.

Keywords: idempotent graph, planar, genus, crosscap.

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