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Some Results on the Fiber Product of Graphs

Fiber product of graphs, which is a special case of cartesian product in a category [**10**], generalizes the usual cross product of graphs and has been first introduced by P. Hell (1972) [**4**]. Let us recall that a **homomorphism** f from a graph $G = (Y, E)$ into a graph $H = (W, F)$, denoted $f : G \to H$, is a usual maping from the set Y into W such that $uv \in E$ implies $f(u)f(v)inF$. The fiber product of the graphs $G = (Y, E)$ and $G' = (Y', E')$ over the homomorphisms $f : G \to H$ and $f : G' \to H$ is the graph denoted $G \times_H G'$ whose vertex set is $Y(G \times_H G') = \{(u, u') \in Y \times Y' \mid f(u) = f'(u')\}$ and where the vertices (u, u') and (v, v') are adjacent **iff** (u is adjacent to v and (u' is adjacent to v') **4**.