

ABSTRACT

The graphs are basic combinatorial structures, and products of structures are a fundamental construction in mathematics, for which theorems abound in set theory, category theory, and universal algebra. Thus it is not surprising that good things happen when we take products of graphs. But the nature of those good things is very surprising indeed; many unique and new ideas emerge, taking both combinatorialists and algebraists by surprise.

The first chapter contains all the required preliminaries to these products. The direct product of graphs plays the most prominent role. The second chapter is devoted entirely to direct product and its characterizations thereof. The other two commutative graph products considered here, the Cartesian and the strong product of graphs with their characterizations, share many properties with the direct product, are included in third chapter. The only non-commutative product treated is the lexicographic in the same chapter at the end.