

## On some graphs of finite groups

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**Abstract.** There are several relevant sets of numerical invariants related to a finite group  $G$ : important examples are the sets  $\omega(G)$  of the orders of the elements of  $G$ ,  $\text{cs}(G)$  of the sizes of the conjugacy classes of  $G$  and  $\text{cd}(G)$  of the dimensions of the irreducible complex representations of  $G$ .

Given set  $X$  of positive integers, one gets an undirected graph  $\Delta(X)$  by taking as vertex set the set of prime divisors of the elements in  $X$  and by joining two distinct vertices  $p$  and  $q$  by an edge if there is a number in  $X$  which is divisible by the product  $pq$ .

We will discuss properties of the graphs that arise by taking as  $X$  one of the sets  $\omega(G)$ ,  $\text{cs}(G)$  and  $\text{cd}(G)$ , respectively, and the interplay between properties of the graphs and the algebraic structure of the group  $G$ .