

Co-Maximal Graphs of Subgroups of Groups

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Abstract. Let H be a group. The co-maximal graph of subgroups of H , denoted by $\Gamma(H)$, is a graph whose vertices are non-trivial and proper subgroups of H and two distinct vertices L and K are adjacent in $\Gamma(H)$ if and only if $H = LK$. In this paper, we study the connectivity, diameter, clique number and vertex chromatic number of $\Gamma(H)$. For instance, we show that if $\Gamma(H)$ has no isolated vertex, then $\Gamma(H)$ is connected with diameter at most 3. Also, we characterize all finite groups whose co-maximal graphs are connected. Among other results, we show that if H is a finitely generated solvable group and $\Gamma(H)$ is connected and moreover the degree of a maximal subgroup is finite, then H is finite. Furthermore, we show that the degree of each vertex in the co-maximal graph of a general linear group over an algebraically closed field is zero or infinite.