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Lower bounds for multi-colored Ramsey numbers from group orbits.

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This paper uses an algorithm to construct all (nonisomorphic) cyclic $(3,3,4)$-Ramsey graphs on K_{29}, all cyclic $(3,3,5)$-Ramsey graphs on K_{44}, and all cyclic $(3,4,4)$-Ramsey graphs on K_{54}. As a consequence of these colorings, $r(3,3,4)\geq 30$, $r(3,3,5)\geq 45$, and $r(3,4,4)\geq 55$, where $r(l,m,n)$ denotes the classical 3-color Ramsey number. The first of these bounds was also found by J. G. Kalbfleisch in his doctoral dissertation, and the second bound was also obtained using cyclic graphs by G. Exoo [Congr. Numer. 59 (1987), 31–36; MR 89e:05144].

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