

Ramsey number for a tree versus a small wheel

Yusuf Hafidh, Edy Tri Baskoro*, Institut Teknologi Bandung (ITB), Indonesia.

For any graphs G and H , we define the *Ramsey number* $R(G, H)$ as the smallest natural number k such that for any graph F of order k , either F contains G as a subgraph or its complement of F contains H as a subgraph. The problem of finding the Ramsey number of a tree T_n on n vertices versus a wheel W_m on $m + 1$ vertices has been extensively investigated. However, the problem is far from completely solved. Y. Chen, Y. Zhang, and K. Zhang (2004) strongly conjectured that $R(T_n, W_m) = 2n - 1$ if the maximum degree of T_n is small and m is even. For a tree T_n with large maximum degree and even m , the $R(T_n, W_m)$ is also unknown in general. In this paper, we shall determine the Ramsey number $R(T_n, W_8)$ for all trees T_n of order n with the maximum degree of T_n is at least $n - 3$.

Keywords: Ramsey number, tree, wheel.