

ON 2-DEFECTIVE COLOURINGS OF TRIANGLE-FREE GRAPHS

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A graph G is (m, k) -colourable if its vertices can be coloured with m colours such that the maximum degree of the subgraph induced on vertices receiving the same colour is at most k . The k -defective chromatic number $\chi_k(G)$ is the least positive integer m for which G is (m, k) -colourable. In 1988 Maddox proved that if either G or \bar{G} is triangle-free graph of order p then $\chi_k(G) + \chi_k(\bar{G}) \leq 5 \lceil \frac{p}{3k+4} \rceil$ for any integer $k \geq 1$. For $k = 1$, he improved the bound to $6 \lceil \frac{p}{5} \rceil$ and in 1997 Simanihuruk et.al improved the bound to the sharp upper bound $2 + \lceil \frac{p-1}{2} \rceil$. In this paper we will study the case $k = 2$ and proved that $\chi_2(G) + \chi_2(\bar{G}) \leq 2 + \lceil \frac{p+3}{3} \rceil$ whenever G is a triangle-free of order p . This improve the upper bound of Maddox for the case $k = 2$.