

# INDUCED CYCLES IN A GRAPH WITH HIGH CHROMATIC NUMBER

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Given a set  $S \subseteq \mathbb{N}$  and an integer  $p$ , can we guarantee that every graph with no clique of size more than  $p$  and high enough chromatic number induces a cycle of length  $\ell \in S$ ? A classical result of Erdős states that, for the answer to be positive, the set  $S$  must be infinite (even in the case  $p = 2$ ). We survey some recent results on the topic and prove that the answer is positive for  $S = 3\mathbb{N}$ .

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