Asymptotic existence of off-diagonal online Ramsey numbers for paths

Sam Beilis, Israel R. Curbelo*, Kean University

The online Ramsey game for paths P_k and P_n is played on the infinite complete graph K_N. Each round, Builder chooses an edge, and Painter colors it red or blue. The online Ramsey number $\tilde{r}(P_k, P_n)$ is the smallest integer t for which Builder has a strategy that guarantees a red P_k or a blue P_n in at most t rounds. In this paper, we prove that for every positive integer k, $\tilde{r}(P_k, P_n)/n$ converges as $n \to \infty$.

Keywords: Ramsey theory, online algorithms, combinatorial games