Rainbow Partitions and Rainbow Polynomial

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Let $G = (V, E)$ be a finite undirected graph with a given edge coloring $\phi: E \rightarrow \{1, \ldots, k\}$. A rainbow path between two vertices of $G$ is a path for which no two edges are colored alike. The graph $G$ is rainbow connected if any two vertices of $G$ are connected by a rainbow path. In this case, the edge coloring is called a rainbow coloring of $G$. A rainbow partition is the partition of the edge set $E$ defined by the color classes of $\phi$. The rainbow polynomial $\rho(G, x)$ which is defined through the rainbow partitions counts the number of rainbow colorings of $G$ with $x$ colors. In this talk we present some results for the rainbow partitions and for the rainbow polynomial.

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