A Few Questions on Color-Critical Subgraphs

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It seems a little presumptuous of us to introduce our own terminology in topics as well-trodden as vertex coloring and $k$-critical graphs, but hey, let’s do it anyway. For a finite, simple graph $G$ of chromatic number $k$, define a sequence of positive integers $(x_1, \ldots, x_k)$ to be the $\chi$-sequence of $G$ if for each $i \in \{1, \ldots, k\}$, the order of a minimum $i$-chromatic subgraph of $G$ is equal to $x_i$. In general, define a sequence $(x_1, \ldots, x_k)$ to simply be a $\chi$-sequence if it is the $\chi$-sequence of at least one graph. In this talk, we will pose a few questions pertaining to these sequences, in particular regarding their possible form as $k \to \infty$.

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