1125-51-1498 **Edgar A Bering**, **Gabriel Conant** and **Jonah Gaster*** (gaster@bc.edu). *On the complexity of finite subgraphs of the curve graph.*

We say a graph has property $\mathcal{P}_{g,p}$ when it is an induced subgraph of the curve graph of a surface of genus g with p punctures. Two well-known graph invariants, the chromatic and clique numbers, can provide obstructions to $\mathcal{P}_{g,p}$. We introduce a new invariant of a graph, the *nested complexity length*, which provides a novel obstruction to $\mathcal{P}_{g,p}$. For the curve graph this invariant captures the topological complexity of the surface in graph-theoretic terms; indeed we show that its value is $6g-6+2p$, i.e. twice the size of a maximal multicurve on the surface. As a consequence we show that large 'half-graphs' do not have $\mathcal{P}_{g,p}$, and we deduce quantitatively that almost all finite graphs which pass the chromatic and clique tests do not have $\mathcal{P}_{g,p}$. We also reinterpret our obstruction in terms of the first-order theory of the curve graph, and in terms of RAAG subgroups of the mapping class group (following Kim and Koberda). Finally, an examination of multipartite subgraphs allows us to compute the upper density of the curve graph, and to conclude that clique size, chromatic number, and nested complexity length are not sufficient to determine $\mathcal{P}_{g,p}$. (Received September 17, 2016)