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Abstract Body

Let  $G$  be a graph without three-cycles. A spanning forest  $F$  of  $G$  is said to be tight if, for each tree in  $F$ , all paths beginning with the smallest vertex of the tree avoid the patterns 231, 312, and 321. The generating function for tight forests of  $G$  is equal to the chromatic polynomial of  $G$  up to a sign change iff the total order on the vertices of  $G$  is a quasi-perfect order. This project strives to determine which graphs have such characteristics by first exploring the following concept: gluing two or more of such graphs to create a new quasi-perfect order graph. We proved that gluing along a single vertex produces our desired result if the vertex is the smallest of at least one graph for every connected pair of graphs. Additionally, we proved that if, for every pair of connected graphs, there are no three cycles and the two smallest vertices of at least one graph are adjacent, then gluing on that edge produces our desired result. Future research will consider other gluing cases.