Prove that each of the following problems is NP-hard.

- 1. Given an undirected graph *G*, does *G* contain a simple path that visits all but 374 vertices?
- 2. Given an undirected graph *G*, does *G* have a spanning tree in which every node has degree at most 374?
- 3. Given an undirected graph *G*, does *G* have a spanning tree with at most 374 leaves?