Name: _____   **ID:** _____

1. Both in Dijkstra and in Prim we have a set of nodes S (that initially contains only s), and we add one additional node in each iteration. Prove or disprove that in both algorithms the nodes are added to S in the same order.

2. Give an efficient algorithm to find the length (number of edges) of a minimum length negative-weight cycle in a graph.

3. Decide whether you think the following statement is true or false.If it is true, give a short explanation. If it is false, give a counterexample.
   Let G be an arbitrary flow network, with a source s, a sink t, and a positive integer capacity c_e on every edge e. If f is a maximum s-t flow in G, then f saturates every edge out of s with flow (i.e., for all edges e out of s, we have $f(e)=c_e$).