1. What is the definition of NP?
2. Is { } in NP?
3. Suppose that is an alphabet. Is in NP?
4. A *bijection* is a function that is one-to-one and onto. Two simple graphs and are *isomorphic* if and there is a bijection such that, for every pair of vertices and in , . The *Graph Isomorphism Problem* (GIP) is the following decision problem.

**Input.** Simple graphs and .

**Question.** Are and isomorphic?

Show that GIP is in NP.

1. Let DOUBLE-SATPL be the following decision problem.

**Input.** A propositional formula ϕ

**Question.** Do there exist two different truth-value assignments and that both make ϕ true?

Show that DOUBLE-SAT is in NP.