Solutions of assignment #3

(Course: CS 401)

Problem 1:

Consider a reduction of an NP-complete problem to a polynomial-time problem. What will be the consequence, if any, if

- the reduction takes polynomial time?
- the reduction takes exponential time?

Solution:

If the reduction takes polynomial time, then any problem in NP can be solved in polynomial time. This would imply P=NP.

If the reduction takes exponential time, it will not have any new consequences since it would only imply that any problem in NP can be solved in exponential time, which is already known (NP$\subseteq$ EXP).