1. **If truth be told...**

   True/False:
   
   (a) A NP Turing machine can only make at most $poly(n)$ nondeterministic transitions on input of lengths $n$.
   
   (b) An NL Turing machine can only make at most $O(\log n)$ nondeterministic transitions on input of lengths $n$.
   
   (c) When we say a function $f$ is computable in space $O(\log n)$, we think of $f$ as having a read-only input tape, a read-write work tape and an output tape. Here, $f$ is allowed to write once to the output tape, and to read from the output tape.
   
   (d) $PSPACE = coNPSPACE$.
   
   (e) NL is closed under the Kleene star operation.

2. **Well-behaved reductions**

   Prove that log-space reductions (through log-space transducers, as defined in class) are transitive i.e. $A \leq_L B$ and $B \leq_L C$ implies $A \leq_L C$.

3. **What can be done**

   Let $ADD = \{\langle x, y, z \rangle \mid x, y, z > 0 \text{ are binary integers and } x + y = z\}$. Show that $ADD \in L$.

4. **And what might be hard**

   We say that a directed graph is strongly connected if every pair of nodes is connected by a directed path in each direction. Let

   $$\text{STRONGLY-CONNECTED} = \{\langle G \rangle \mid G \text{ is a strongly connected graph}\}$$

   Show that $\text{STRONGLY-CONNECTED}$ is $\text{NL}$-complete.