1. Show that if all tally sets in \( NP \) are in \( P \), then \( EXT=NEXT \).

2. Is
   (a) \( DTIME(n) = DTIME(n + 1)? \)
   (b) \( DTIME(2^n) = DTIME(2^n+1)? \)
   (c) \( DTIME(2^{2n}) = DTIME(2^{2n+1})? \)

3. Show \( NP \neq DSPACE(n) \) (exercise 7.4.7). Maybe show that one of the classes is closed under \( n^2\)-erasing.

4. Show that the subgraph isomorphism problem is \( NP \)-complete. (exercise 9.5.23, part (a))

5. Show that the firehouse problem is \( NP \)-complete: Given a graph \( G \) and integers \( f \) and \( d \), is there a way to select \( f \) vertices of \( G \) on which to locate “firehouses” so that no vertex is at distance more than \( d \) from a firehouse?

6. Let \( HP \) refer to the Hamilton path problem, and \( HC \) to the Hamilton cycle problem. Show directly that \( HC \equiv_m HP \).