1. [20 points] Problem 3.5(a). Use Rule NWAIT (Fig 3.6).

2. [20 points] Construct a WAIT diagram for the overtaking property of:

   (i) Problem 3.5(a)

   (ii) Problem 3.7

   Don’t show or prove the VCs.

   Please note that for the problems above, you can make use of (correct) invariants about programs MUX-DEK and/or MUX-BAK-A from previous homeworks. You can also prove additional invariants apart from the diagrams / NWAIT formulas if you need to, but if you do, please say what they are and give the proofs.

3. [30 points] Compute \(\omega\)-automata (Muller and Streett) and an \(\omega\)-regular expression for each of the following LTL formulas (nine answers total):

   (i) \(\Box(\neg p \lor \Diamond q)\)
   (ii) \(\Box\neg p \lor \Diamond q\)
   (iii) \(\Box\neg p \rightarrow \Box\Diamond q\)