1. Consider Model A, the distributed model with asynchronous processors and asynchronous communication where each computation step by processor $p_i$ clears all inbuffers of $p_i$. Now, consider Model B, which is otherwise the same as Model A but each computation step by processor $p_i$ removes a single message from some inbuffer. Argue that Model B is at least as strong as Model A.

2. Exercise 3.3 *Hint: Don’t forget the 2-processor case.*

3. Exercise 3.5 *Hint: Use a reduction.*

4. The two asynchronous leader election algorithms we studied, with message complexity $O(n^2)$ and $O(n \log n)$, respectively, should also work in synchronous systems. Analyze their time complexity in the synchronous model. Assume that starts are synchronized.

5. Problem 3.10

6. Consider the uniform synchronous algorithm that we discussed in class. The algorithm requires every sleeping processor to forward messages without delay. Prove or disprove:

   (a) A sleeping processor can be wakened by a message which has already been delayed.

   (b) A message which has been forwarded after a delay by one processor will not be forwarded later without delay by another processor.

   (c) Given a message which is being forwarded one edge per round, the first processor to delay the message must be a participating processor, i.e., a processor that wakes up spontaneously.