1. Let $P$ be a polynomial of degree $m$ and $R$ be a polynomial of degree $n$. Write the following parallel algorithms for $Q = PxR$ in pseudo-code. Do a time complexity analysis of your algorithms.
   a. CRCW PRAM with $\max(m, n)$ processors
   b. EREW PRAM with $\max(m, n)$ processors
   c. 2–dimensional mesh with $M_{n+1, m+1}$ with $(n+1)(m+1)$ processors. Assume that initially the first column contains polynomial $P$, that is $M_{i, 1} = a_{i-1}$. Similarly first row contains polynomial $R$.

2. Consider the following function $f(X, n) = X^n$. I am to write a code for this algorithm on a machine which cannot directly compute powers, i.e. I have to write the code using comparisons and multiplications. I am claiming that the lower bound of the time complexity $W(n)$ is $O(n)$. Am I wrong? Explain why or why not.

Write your pseudo-code clearly and follow the syntax used in lectures. Comment on your code if you feel it is necessary to understand your algorithm.