Solutions to AS.1

Part I:
From textbook: Intro to Algorithms, Cormen, Rivest et al.

1. Ex. 5.4-1

1. Method: Induction on the number of edges
   
   **Base:** For a graph of \( n \) edges it holds: \( \sum d(u) = 2|E| \)
   
   1. Base: for \( n = 0 \), it holds trivially
   
   2. Hypothesis: It holds for \( n = k \), for \( G_k(V_k,E_k) \).
   
   3. Prove for: \( n = k+1 \), \( G_{k+1}(V_{k+1},E_{k+1}) \).
   
   **Argument:** 1 edge will increase by one the degree of two nodes.
   
   \[
   \sum_{G_{k+1}} d(u) = \sum_{G_k} d(u) + 2
   \]
   
   \( E_{k+1} = k+1 \), \( E_k = k \).

2. Method: with just the argument that 1 edge \( \rightarrow \) is counted twice in the degree of the nodes.

**DISCLAIMER:**
This is provided for your convenience.

Keep a critical mind, as some (hopefully minor) errors may exist.

Also, there are usually more than one way to solve these