Automata Theory: Assignment 1

Due date: January 10 (Thursday)

Problem 1 (3 points)
Draw an example of an undirected connected acyclic graph with six vertices. How many edges are in your graph?

Problem 2 (3 points)
Prove that, if $S_1 \subseteq S_2$ and $S_3 \subseteq S_4$, then $(S_1 \cap S_3) \subseteq (S_2 \cap S_4)$.

Problem 3 (4 points)
Prove that the following results hold for every natural number n:

(a) $1 + 3 + 5 + 7 + ... + (2 \cdot n - 1) = n^2$

(b) $\frac{n}{n+1} < \frac{n+1}{n+2}$