Homework 1 – Problem #5

Given:
A language, A_k, where k >1, there must be a DFA with at least k states.

Proof by explanation:

There is no *maximal* DFA since states and transitions can always be added to the DFA, but without transitions between the original state and the new one.

Therefore, new states cannot be reached by the initial state and the accepted language will remain the same.

That said, there is no NFA with an equivalent *maximal* DFA.

Therefore, A_k must exist within a DFA of *at least* k states.