1) Which of the following Markov chains admits:
   - a unique stationary distribution?
   - a (unique) limiting distribution?

   \[ a) \quad 1 \rightarrow 2 \rightarrow 3 \]
   \[ b) \quad 1 \rightarrow 2 \rightarrow 3 \]
   \[ c) \quad 1 \rightarrow 2 \rightarrow 3 \]
   \[ d) \quad 1 \rightarrow 2 \rightarrow 3 \]
   \[ e) \quad \text{(diagram)} \]
   \[ f) \quad \text{(diagram)} \]
2) Which of the following statements is correct?

a) If $X$ is an irreducible and null-recurrent chain, then
   a1) its state space $S$ is infinite
   a2) it does not admit a stationary distribution
b) If $X$ is finite and irreducible, then it admits a unique limiting and stationary distribution.
c) If $X$ does not admit a unique stationary distribution, then some states are not positive-recurrent.
d) If $X$ admits a stationary distribution (not necessarily unique), then some states are positive-recurrent.