Problem 1

Proof :

> Assume there exists an $a \in \mathbb{R}$ such that $a \leq b$ for all $b \in \mathbb{R}$,

> $a - 1 < a$, so it is not true that $a \leq b$ for all $b \in \mathbb{R}$. Therefore, the assumption is false.

Problem 2

a) $2 + 4 = 6$

b) $40 \% 3 = 1$

Problem 3

a) i) The set of states is $\mathbb{N} \times \mathbb{N} = \{(h, t) \mid h, t \in \mathbb{N}\}$, where (h, t) represents the state with h heads and t tails.

ii) The start state is $(98, 4)$

b) Proof:

> $P(n) := a_n \leq c \cdot 2^n$

> This is a sample proof!