1: Purpose to show why there are two parts of induction steps required.

Given the statement $P(n)$ = "10^n is divisible by 7"

(a) Prove that $P(n) \to P(n+1)$ is a tautology.

Comments. You are doing step 2 first!

Case 1: $P(n)$ is false for all nonnegative integers n then the conditional will always be true.

Case 2: $P(n)$ is true for some nonnegative integer n.

YOU FILL IN THE REST and explain why $P(n+1)$ must also be true.

(b) Prove that $P(n)$ is not true for any nonnegative integer.

(c) Do the results in part (a) and part (b) contradict the principle of mathematical induction? Explain.