‘Theorem’. All horses are the same color.

Proof: Let $S_n$ denote the statement that for any group of $n$ horses, they all have the same color. Clearly with just 1 horse, all of the horses have the same color, so $S_1$ is true. Now, for the induction step: we’ll show that if it is true for any group of $n$ horses, that all have the same color, then it is true for any group of $n + 1$ horses. Given any set of $n + 1$ horses, if you exclude the last horse, you get a set of $n$ horses. By the induction step these $n$ horses all have the same color. But by excluding the first horse in the pack of $n + 1$ horses, you can conclude that the last $n$ horses also have the same color. Therefore all $n + 1$ horses have the same color. Thus $S_n$ implies $S_{n+1}$, so the statement is true for all $n$. □

This example is usually attributed to the mathematician George Polya (1887-1985).