Four Basic Ingredients of a Proof

A proof should contain ingredients which answer the following four questions:

- What is being assumed?
- What is being proved?
- What are the tools that are being used?
- Why is it legitimate to use those tools?

Sometimes the presence of these ingredients in a proof is implicit. But, it should always be easy to identify them.

A mathematical statement is like a puzzle in which you are given assumptions and a conclusion. Your task is to find a proof. That is like finding a path through a maze that connects the assumptions and the conclusion. So, a good strategy to start a proof is to write clearly what assumptions are, and what is to be proved. Than look for possible connections. List possible tools. Colors always help! Have fun!