Suppose we want to prove the NP-completeness of a problem $Y$. Here is the sequence of steps to be used in proving such a result.

1. Show that problem $Y$ is in NP. (For this, you need to show how to verify in polynomial time that a given solution satisfies all the required properties.)

2. Identify a suitable problem $X$ which is known to be NP-complete.

3. Explain how any instance $I_x$ of problem $X$ can be transformed into an instance $I_y$ of problem $Y$.

4. Show that the transformation described in Step 3 can be carried out in polynomial time.

5. Show that there is a solution to instance $I_x$ of $X$ if and only if there is a solution to instance $I_y$ of $Y$. This proof involves the following two parts.

   (i) Assume that $I_x$ has a solution and show how a solution to $I_y$ can be constructed.

   (ii) Assume that $I_y$ has a solution and show how a solution to $I_x$ can be constructed.

Note: Step 1 above proves the membership of problem $Y$ in NP. The remaining steps prove the the NP-hardness of problem $Y$. 

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Sequence of Steps Used to Prove NP-completeness