

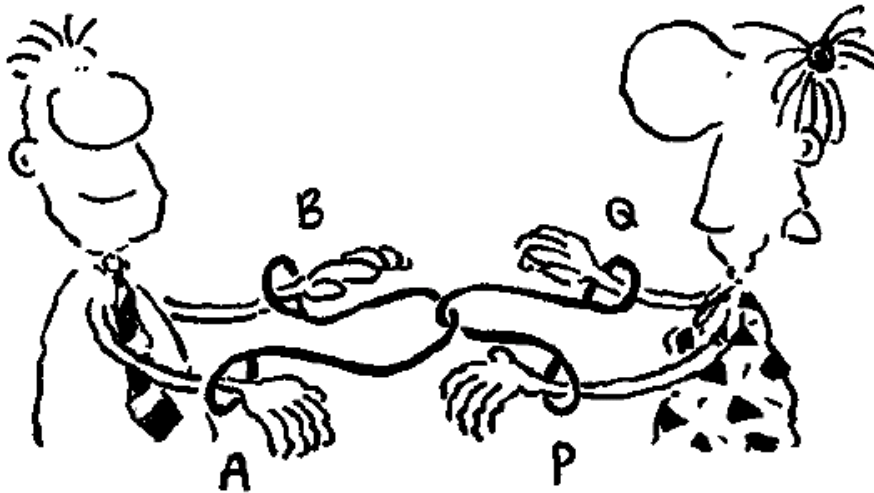
1. The attic lamp switch

A downstairs panel contains three on-off switches, one of which controls the lamp in the attic—but which one? Your mission is to do something with the switches, then determine after *one* trip to the attic which switch is connected to the attic lamp.

2.

A topological trick

At a party Norman and Nuala were tied together as shown and challenged to separate themselves without untying the string or cutting it. To make it quite clear, Norman has one end of a piece of string tied around his right wrist, *A*, and the other end tied around his left wrist, *B*. Nuala has a second piece of string with one end tied around her left wrist, *P*, and then looped under and over Norman's string before the other end is tied around her right wrist, *Q*. Try it yourself with a friend. It may look impossible to solve at first but there is a neat way of unravelling yourselves which doesn't require any acrobatics.



Solutions:

1.

It really is impossible to tell which switch is connected to the attic lamp if all you get is one bit of information from your trip to the attic. However, you can get more information with your hand! Turn on Switches 1 and 2, wait a few minutes, then turn off Switch 2 before ascending to the attic. If the bulb is off, but warm, you conclude that Switch 2 is the winner. ♡

2.

A topological trick

First Nuala takes her string at about its middle and passes it under the loop of string around Norman's right wrist, A , on the inside of the wrist and in the direction from elbow to hand. Next she loops the string up over his hand to the outside of his wrist. She should now be able to walk away leaving Norman and any onlookers amazed. Their own wrists will still be tied together but they will not be linked together. Be warned, however, if you don't follow the instructions precisely the strings can easily become more entwined.

For example, if Nuala's string goes from Q under Norman's string before looping around it to P , then Nuala will need to operate on Norman's left wrist as above instead of his right wrist. The only way to appreciate how this works is to do it with a friend, as many times and as slowly as it requires to follow what happens.