1. On the television program "Let's Make a Deal," a prize is placed at random behind one of three doors. The contestant then selects one of the doors. At that point, the host, Monty Hall, opens one of the two doors other than the one selected, and reveals that it is not the door to the prize. (He always opens a door that does not have the prize; if both unselected doors do not have the prize behind them, he picks one of them at random.)

   Suppose that a contestant selected door number 1.

   (a) Find the probability that the prize is behind door number 1.

   (b) Monty Hall then opened door number 2 and revealed that it had no prize.

   Find the probability that the prize is behind door number 3.

   (c) What should the contestant do at that point? Should he stay with door number 1 or switch to door number 3, or is it irrelevant?