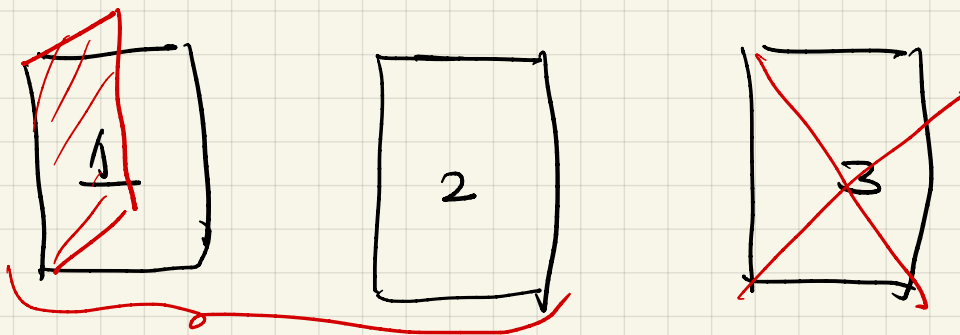# Monty Hall Problem

prize behind one of doors.

no prize behind other two doors.

Step 1) Choose one of the doors.   (say door 3)

Step 2) Monty open a door that is not yours and does not have the prize.   (say door 1).

Step 3) Do you want to switch?

Right thing to do: Switching door increases the chance of winning the prize.

Probability before switching:

— — —

$$P\left(\begin{array}{l}\text{Your choice was}\\\text{the prize door}\end{array}\right) = \frac{1}{3}. \qquad \text{(step 1)}$$

$$\lessgtr$$

$$P\left(\begin{array}{l}\text{Door 3 is the}\\\text{prize door}\end{array}\right) = \frac{1}{3}$$

Given B has happen the prize can only be behind ② or ③.

$$B = \{\text{Door 1 is not the prize door}\}$$

$$P\left(\begin{array}{l}\text{won the}\\\text{prize}\end{array}\Bigg| B\right)$$

→ Could stay with original choice

→ Could switch to the other unopened door.