p609 · #17-18

$P(\text{Junior}) = \frac{100}{400} = \frac{1}{4}$ $\quad P(J \cap H) = \frac{39}{400}$

$P(\text{Human}) = \frac{156}{400} = \frac{39}{100}$

① J + H are independent if $P(J)P(H) = P(J \cap H)$

② J + H are indep if $P(J|H) = P(J)$ and $P(H|J) = P(H)$

$P(NS) = 147/400$ $\quad P(NS \cap J) = \frac{33}{400}$ $\quad P(J) = \frac{1}{4}$

7b $P(R) = \frac{1}{2}$

$P(\diamondsuit) = \frac{1}{4}$

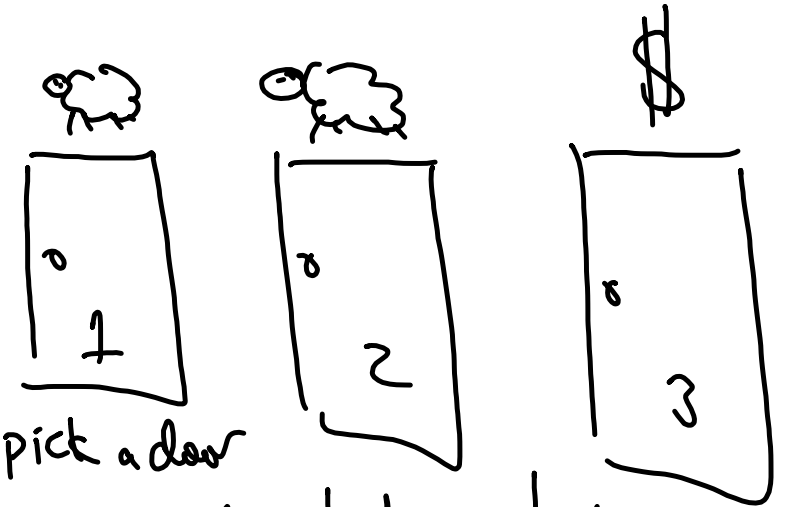
$P(R) P(\diamondsuit) \neq P(R \wedge \diamondsuit)$

$P(R \wedge \diamondsuit) = \frac{1}{4}$

② $P(\diamondsuit \mid R) = \frac{1}{2} \neq P(\diamondsuit) = \frac{1}{4}$

$P(R \mid \diamondsuit) = 1 \neq P(R) = \frac{1}{2}$

Monte Hall



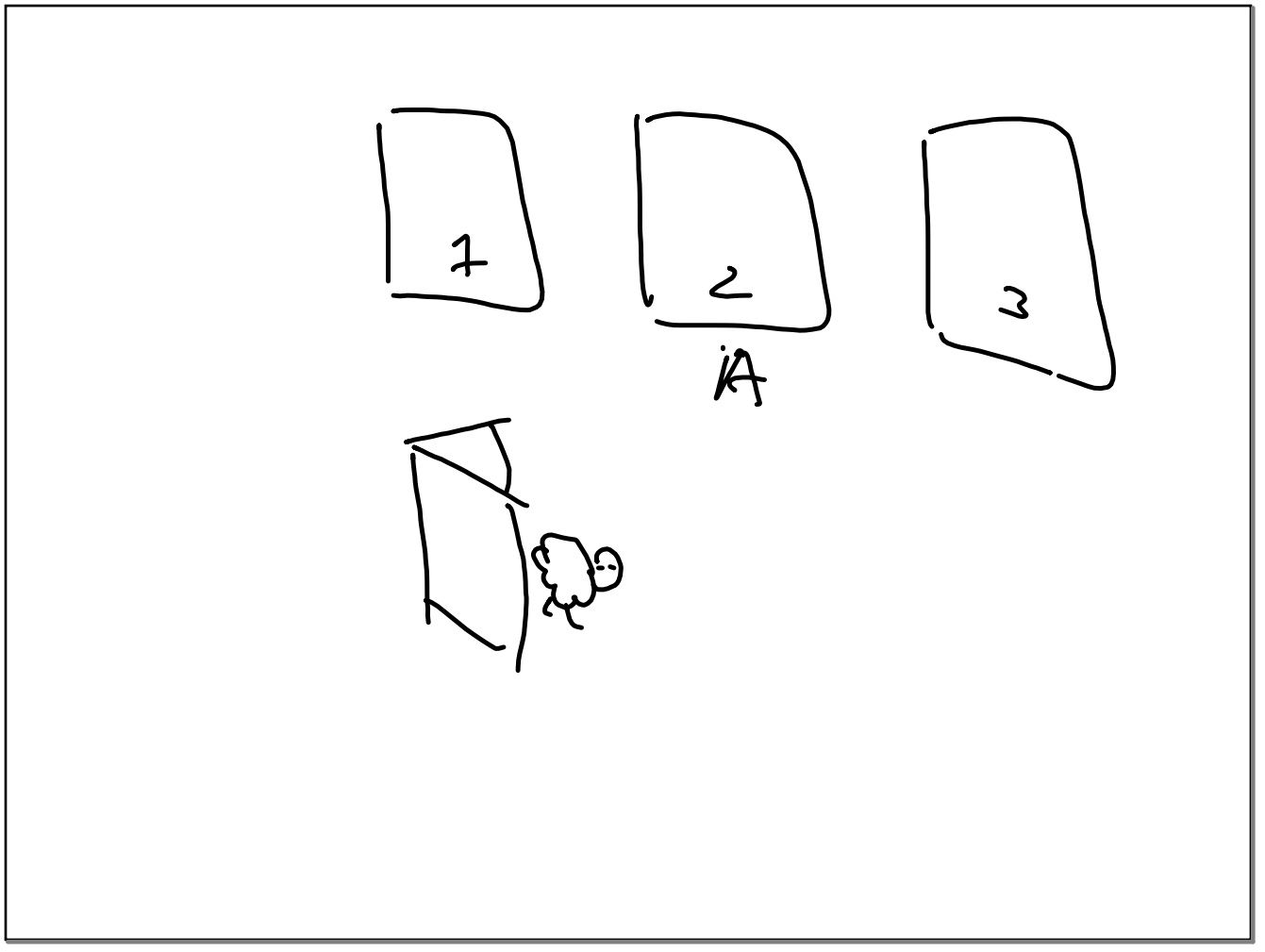
(1) pick a door

(2) Monte opens one door behind which is a sheep.

(3) would you like to change your choice?

A: the probability is in your favor to change.

May 22, 2015



Conditional Probability

$$P(A|B) = \frac{P(A \cap B)}{P(B)}$$

Drug Testing: (steroids, Performance Enhancers)

false positive → ND but +

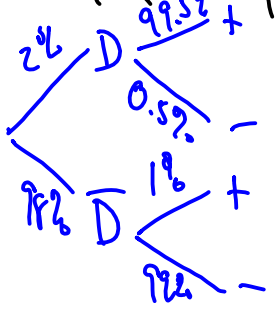
false negative → D but −

Ex false + 1%

false − 0.5%

assume $P(D) = 2\%$.

$$P(D|+) = \frac{P(D \cap +)}{P(+)}$$



$$= \frac{(.02)(.995)}{(.02)(.995) + (.98)(.01)}$$

$$\simeq \frac{.0199}{.0199 + .0098} = .67$$

67%