Conditional Probability
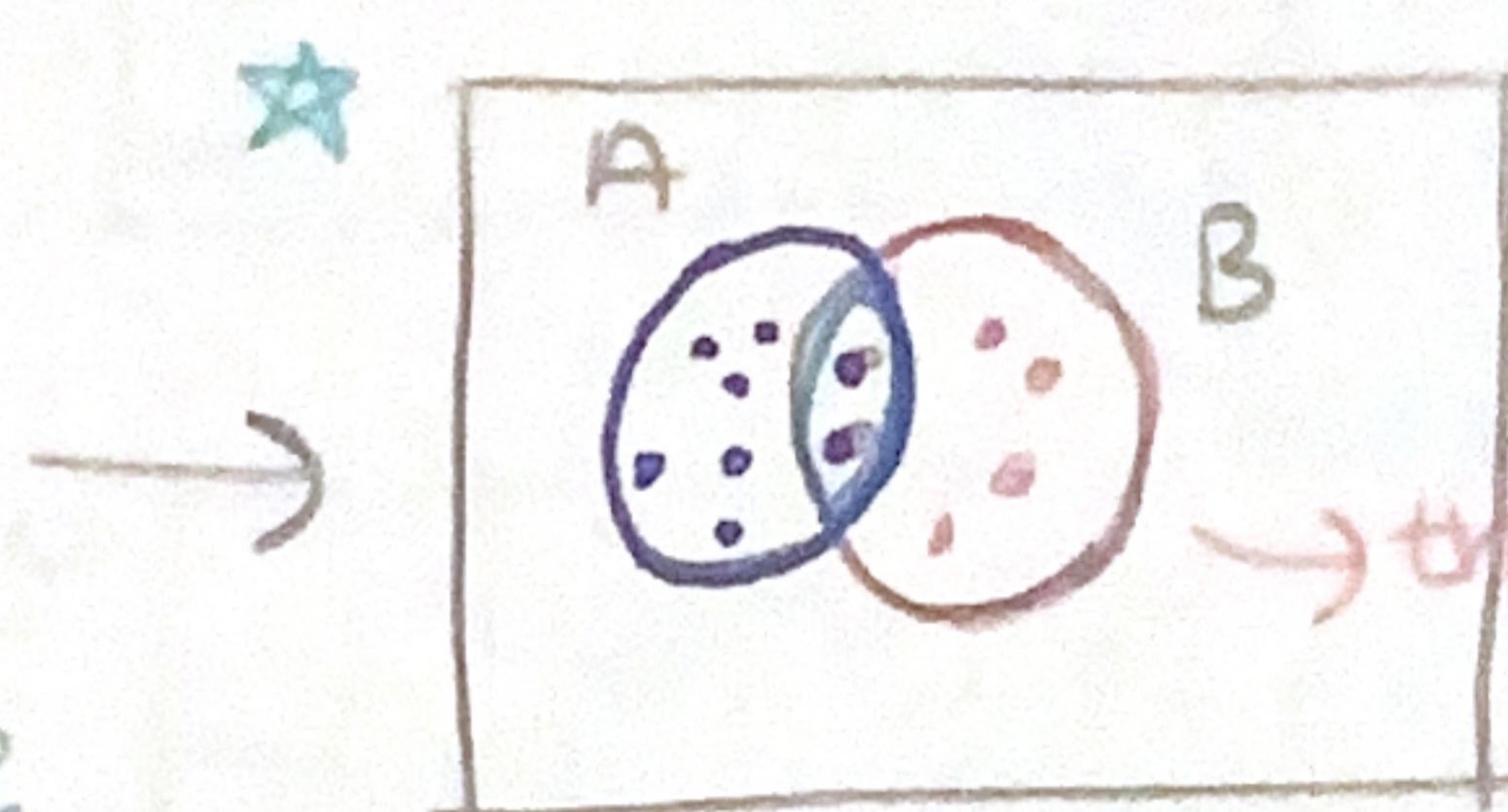
- $P(A|B) \rightarrow$ A given B
  - $\downarrow$ $\hookrightarrow$ event that happened
  - event I'm looking for

- $P(AB) = P(B) \cdot P(A|B)$ given B has happened, let A happen
  - $\downarrow$ how can A & B happen together?
  - $\searrow$ let B happen

- $P(A|B) = \dfrac{P(AB)}{P(B)}$ $P(B|A) = \dfrac{P(AB)}{P(A)}$

$$P(A|B) = \dfrac{P(A)P(B|A)}{P(B)}$$
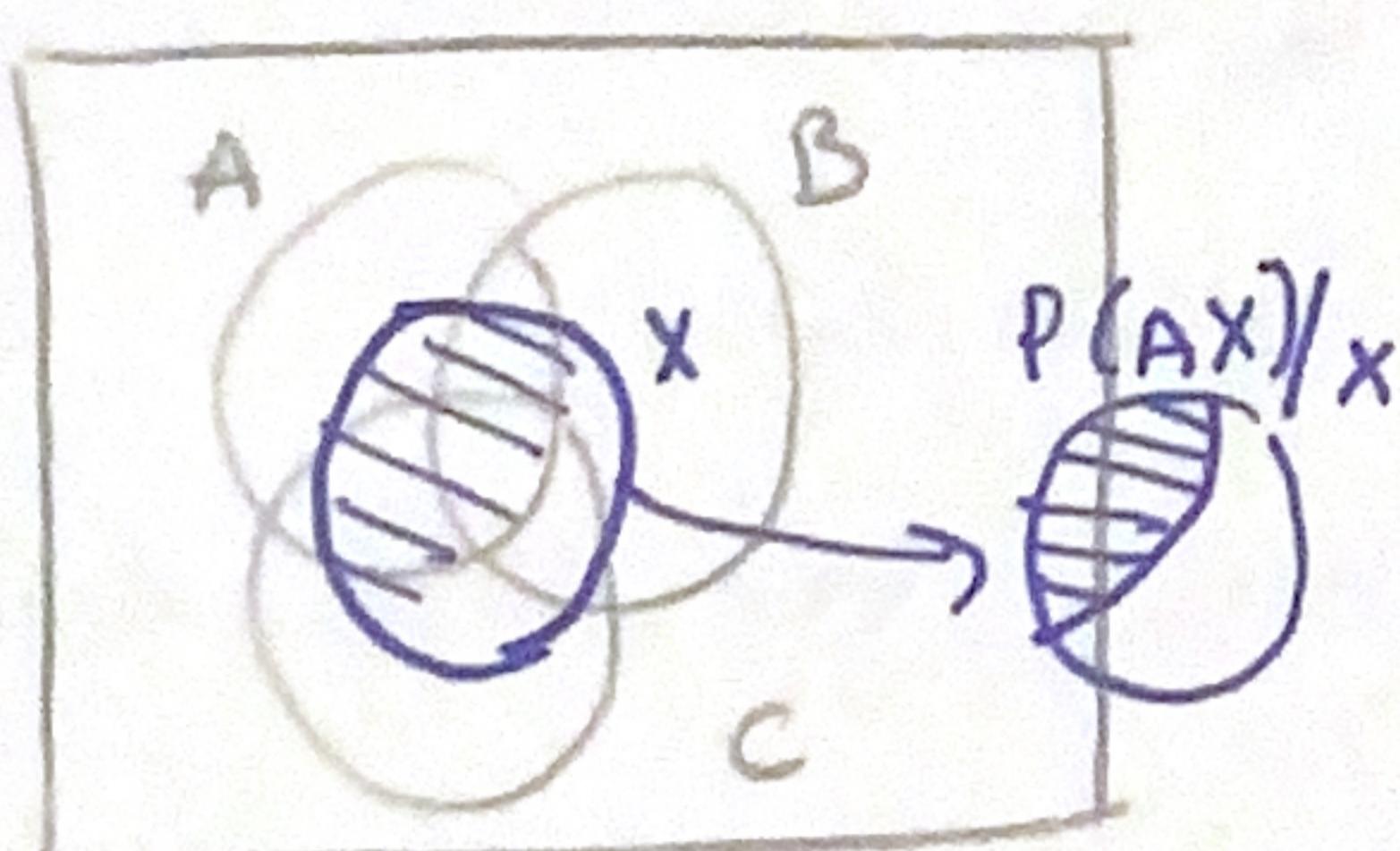
Bayes' Rule

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$\rightarrow$ the universal set is this now
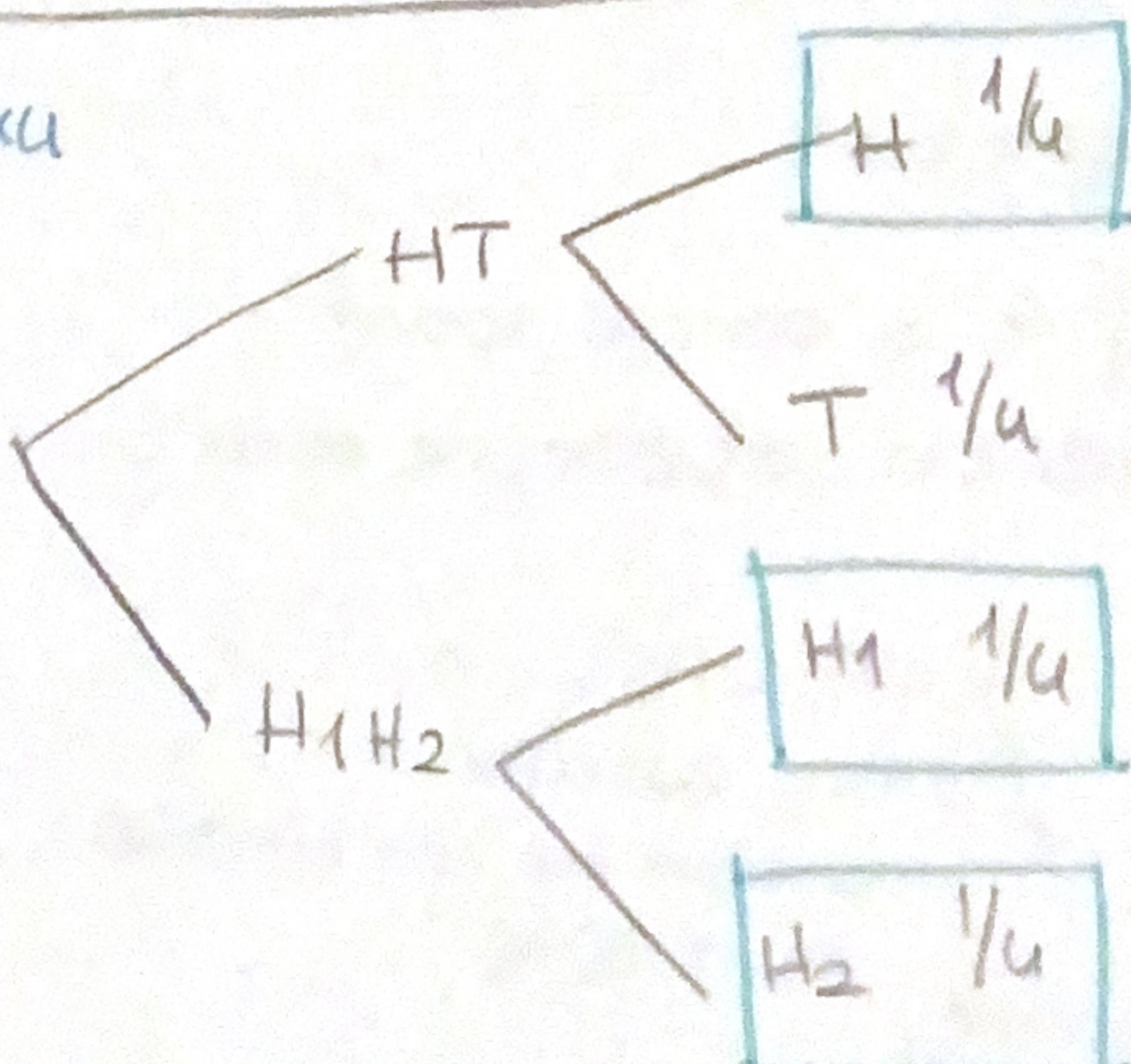
$$P(A) = P(\odot) \quad \nearrow \text{intersection}$$
$$P(A|B) = \dfrac{P(\odot) \quad P(AB)}{P(\otimes)}$$

what is prob of A & B happening together when sample space is B happening?

exu

Given: Heads is observed

$P(\text{Heads observed}) = P(H_1) + P(H_2) + P(H)$

$$P(H_1) = \dfrac{P(H_1 H_0)}{P(H_0)}$$

New sample space