$$\Omega = \{e_1, e_2, e_3\}$$

$\mathcal{P}(\Omega)$ insieme delle parti

INSIEMI	PROB.
$\emptyset$	0
$\{e_1\}$	$1/3$
$\{e_2\}$	$1/3$
$\{e_3\}$	$1/3$
$\{e_1, e_2\} = \{e_1\} \cup \{e_2\}$	$2/3$
$\{e_1, e_3\} = \{e_1\} \cup \{e_3\}$	$2/3$
$\{e_2, e_3\} = \{e_2\} \cup \{e_3\}$	$2/3$
$\Omega = \{e_1, e_2, e_3\} = \{e_1\} \cup \{e_2\} \cup \{e_3\}$	1

CON RIP ORDINATI

$$\underbrace{N \times N \times \qquad N}_{n \text{ volte}} = N^n$$

SENZA RIP ORDINATI

$$N \cdot \underbrace{(N-1) \cdot (N-2) \cdot \ldots}_{n \text{ fattori}} (N-n+1) = (N)_n$$

$$= \frac{N!}{(N-n)!}$$

SENZA RIP ORDINATI

$$\frac{(N)_n}{n!} = \frac{(N)_n \, (N-n)!}{n! \, (N-n)!} = \frac{N!}{n! \, (N-n)!} =$$

$$= \binom{N}{n} = \binom{N}{N-n}$$

NON ORDINATI CON RIPOSIZIONE

esempi

a 3

b 2

c 4

d 1

$N=4$

$n=10$

$$\overset{a}{\times\times\times} \,/\, \overset{b}{\times\times} \,/\, \overset{c}{\times\times\times\times} \,/\, \overset{d}{\times}$$

$N-1$ barre

n asterischi

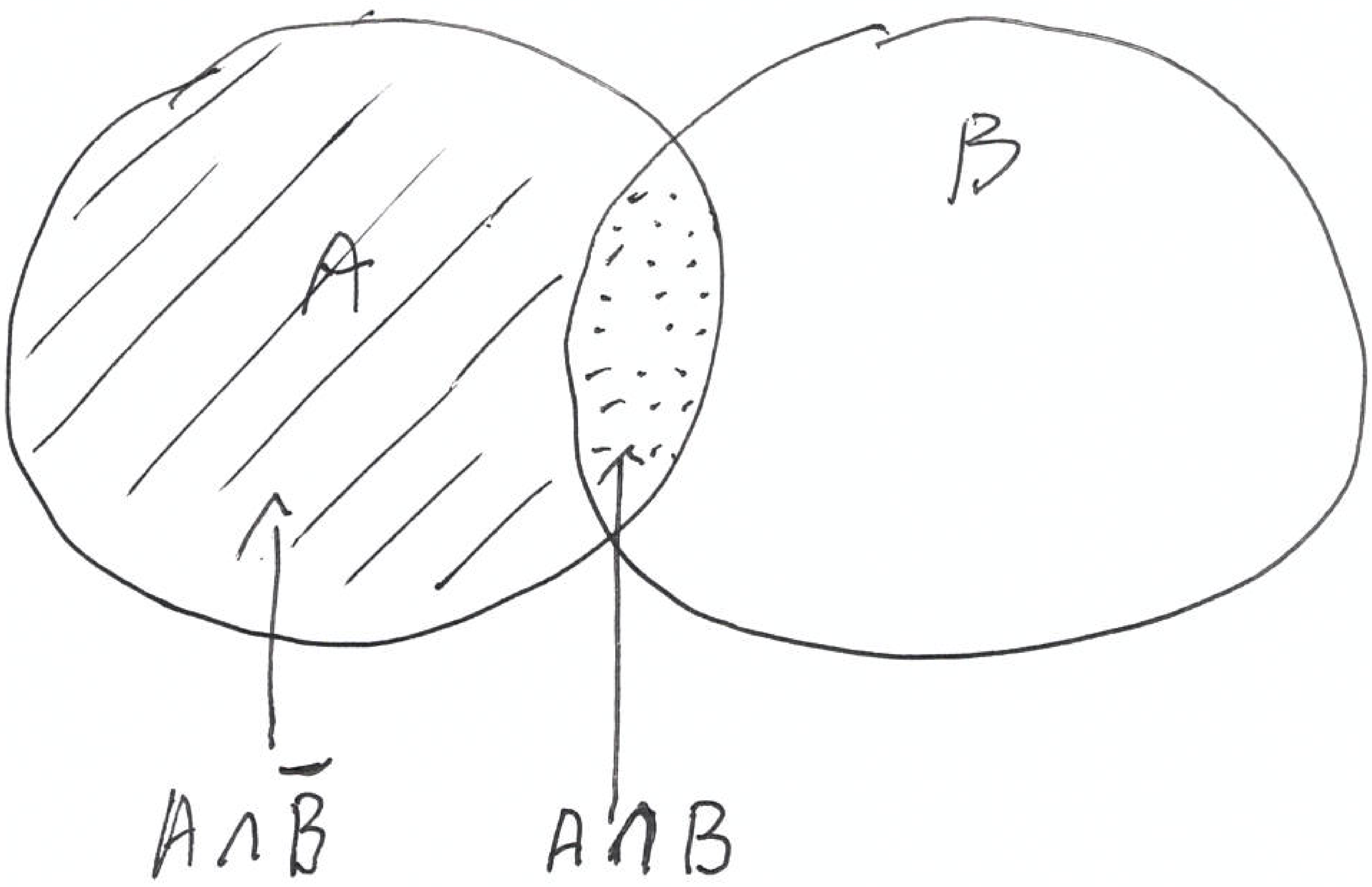
$N-1+n$ posizioni

$$\binom{N-1+n}{n} = \binom{N-1+n}{N-1}$$

modi di scegliere posizioni per $*$

modo di scegliere posizioni per /

PROBABILITA TOTALE



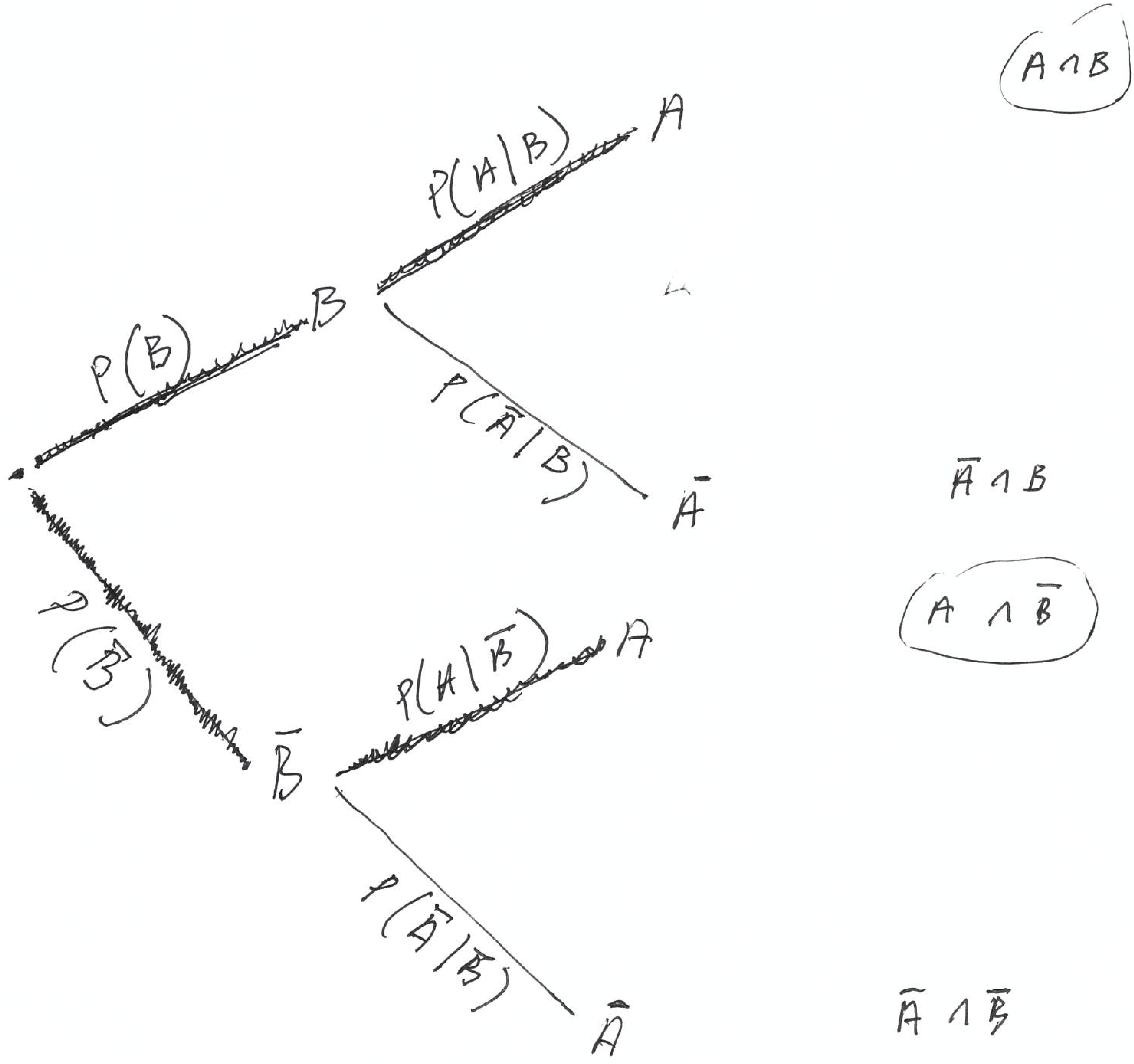
$$A = (A \cap B) \cup (A \cap \bar{B})$$

$$P(A) = P(A \cap B) \cup P(A \cap \bar{B})$$

$$= P(A|B) \times P(B) + P(A|\bar{B})\, P(\bar{B})$$

BAYES

$$P(B|A) = \frac{P(A \cap B)}{P(A)} = \frac{P(A|B) \times P(B)}{P(A|B) \times P(B) + P(A|\bar{B})\,P(\bar{B})}$$



B malato $\quad \bar{B}$ non malato

$P(B) = 0.2$ (incidenza)

A positivo al Test

$\bar{A}$ negativo al Test

$P(A|B) = 0.9$ (sensibilità)

$P(\bar{A}|B) = 0.1$ (falsonegativo)

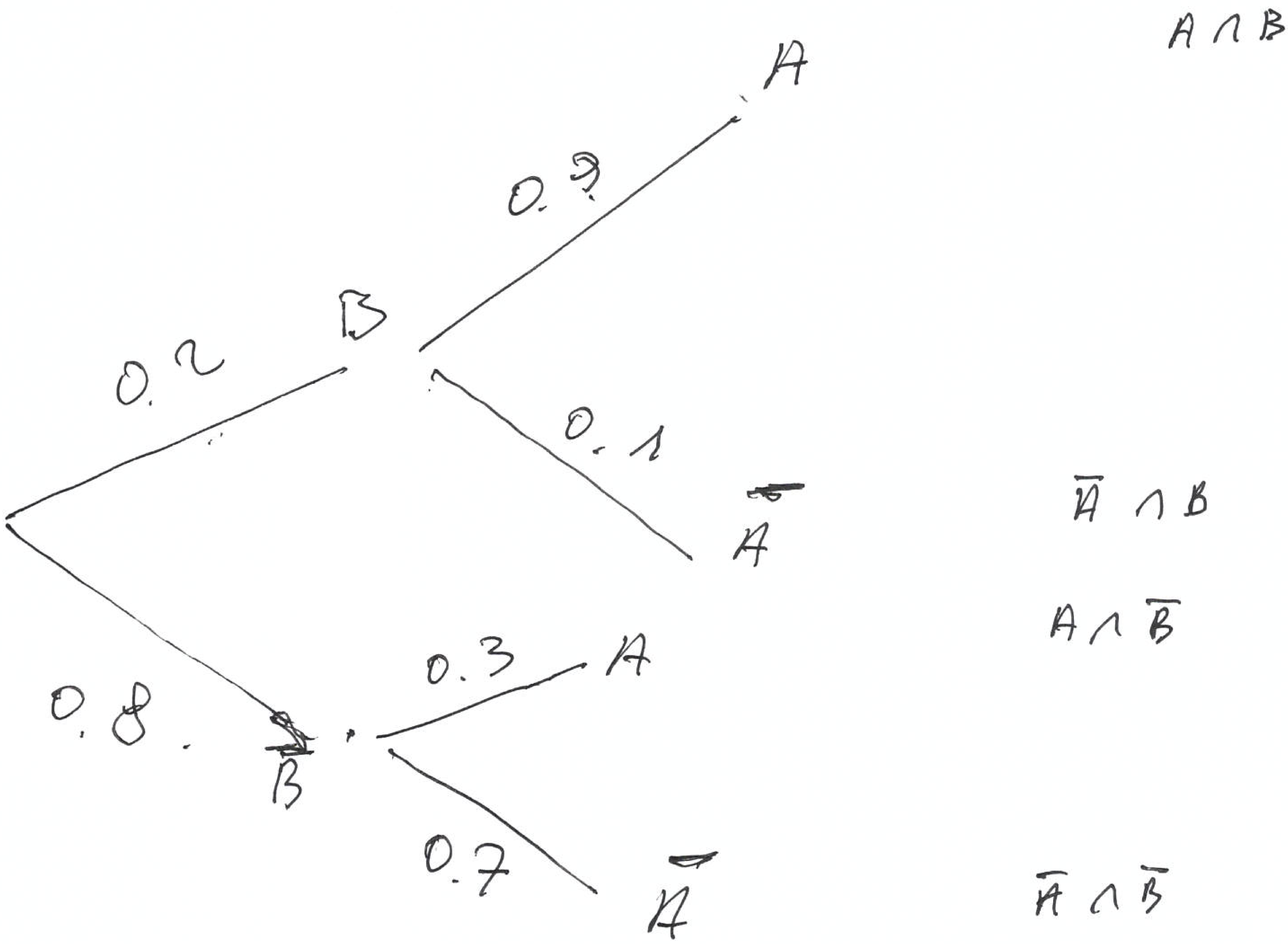
$P(A|\bar{B}) = 0.3$ (falso positivo)

$P(\bar{A}|\bar{B}) = 0.7$ (specificità)

$$P(B|A) = \frac{0.9 \times 0.2}{0.9 \times 0.2 + 0.3 \times 0.8} = 0.429$$

$$P(B \cap A) + P(\bar{B} \cap \bar{A}) = 0.2 \times 0.9 + 0.8 \times 0.7 = 0.74$$

$$P(B|\bar{A}) = \frac{0.2 \times 0.1}{0.2 \times 0.1 + 0.8 \times 0.7} \simeq 0.035$$


0.2
B
0.9
A
0.1
$\bar{A}$
0.8
$\bar{B}$
0.3
A
0.7
$\bar{A}$
$A \cap B$
$\bar{A} \cap B$
$A \cap \bar{B}$
$\bar{A} \cap \bar{B}$