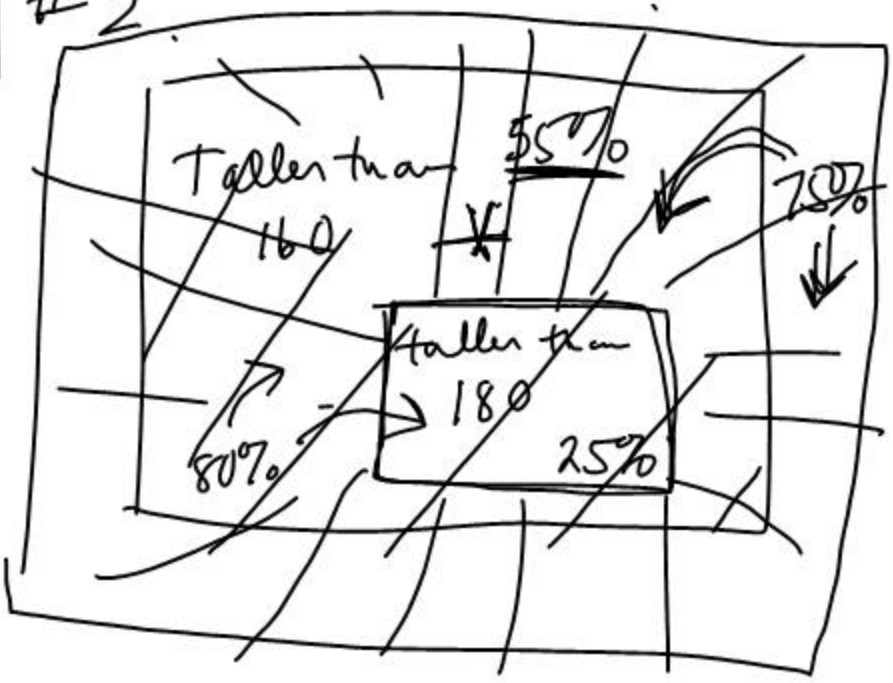
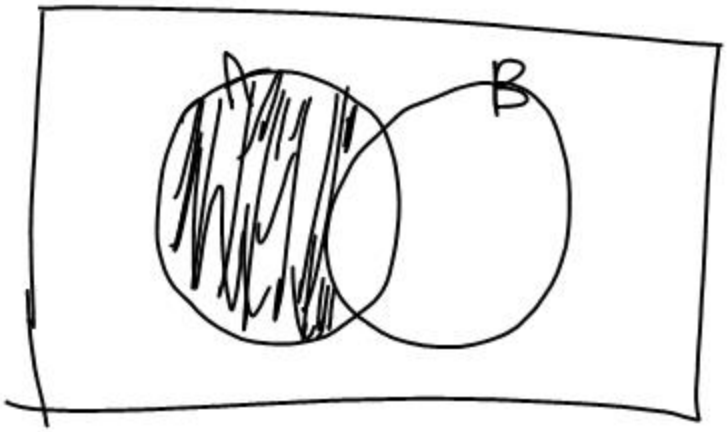
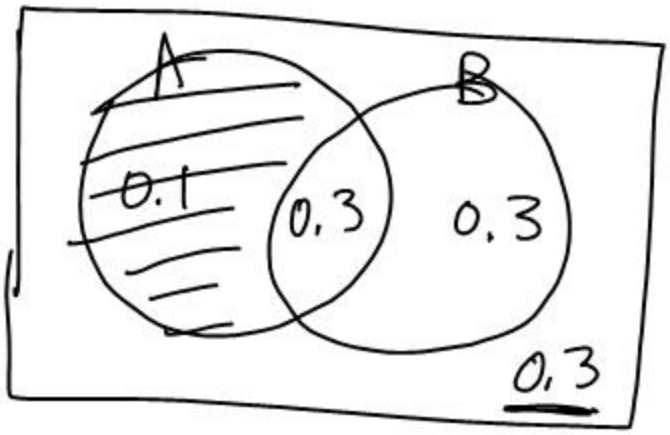
6H #2





$A \setminus B$

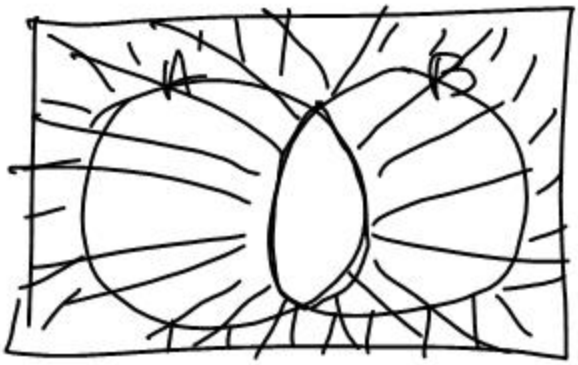
#1



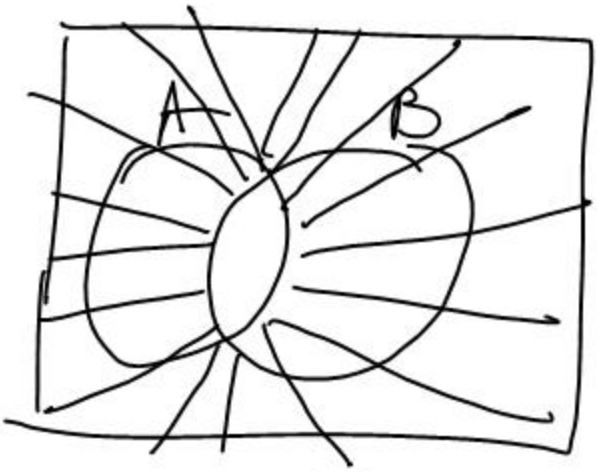
$$\begin{array}{r} .4 \\ +\ .16 \\ \hline 1 \\ -0.7 \\ \hline 0.3 \end{array}$$

(b) $P(A \cap B') = 0.1$ (c) $P(A' \cup B') = 1 - 0.3$

$= 0.7$



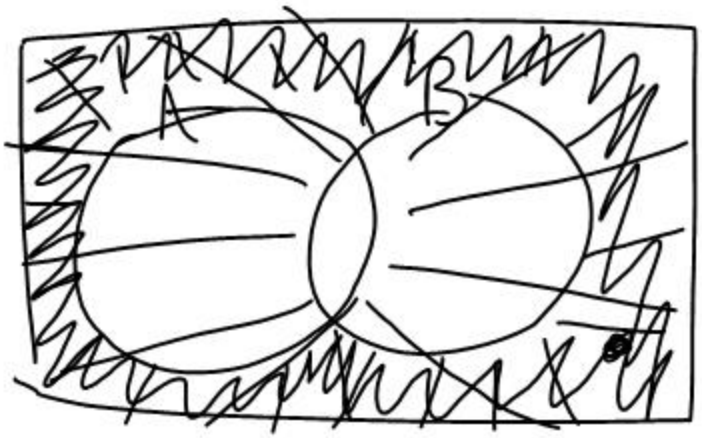
$A' \cup B'$



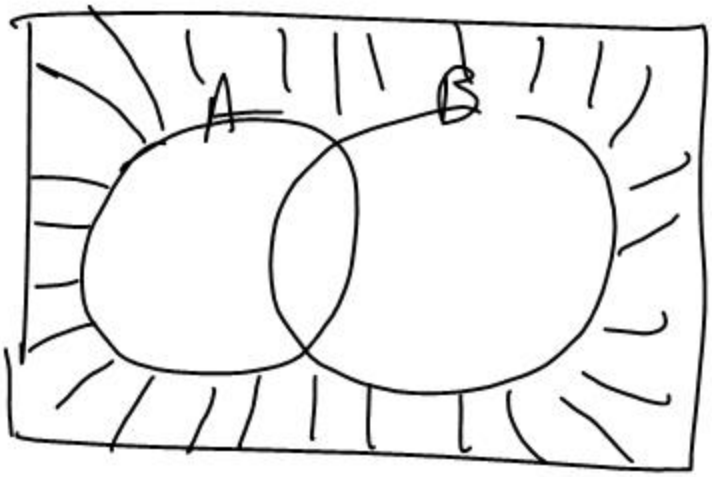
$(A \cap B)'$

$\longleftrightarrow$

De Morgan's Laws

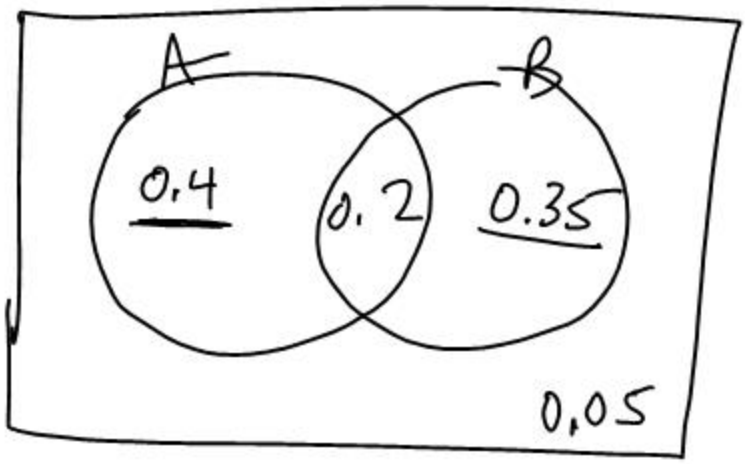


$A' \wedge B'$



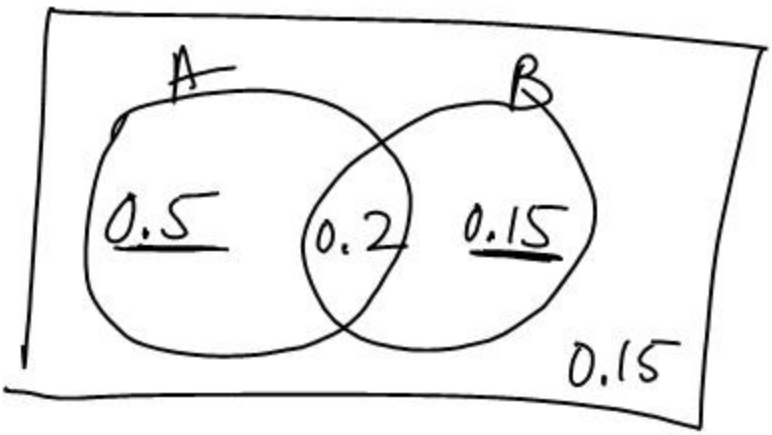
$\longleftrightarrow$ $(A \cup B)'$

#3.



0.4
0.2
0.35
.95

#4



.5
.2
0.7

Conditional Probability

Ex. Draw 2 cards.

Event A = 1st card is a heart

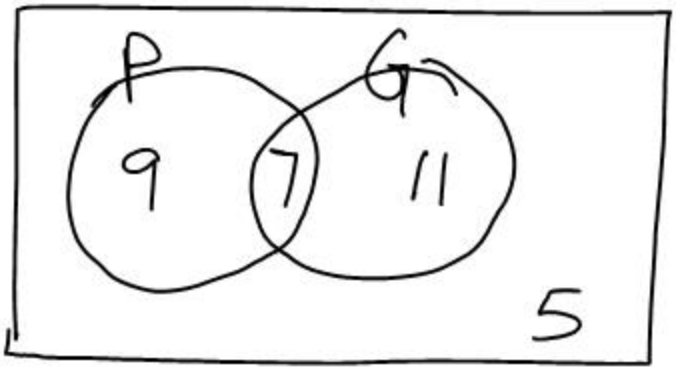
Event B = 2nd card is a heart.

$P(A) = \frac{1}{4}$ $P(B|A) = \frac{12}{51}$

$P(B|A') = \frac{13}{51}$

↑ condition

Ex 6F #2



$$P(G|P) = \frac{7}{16} = \frac{P(P \cap G)}{P(P)} = \frac{\frac{7}{32}}{\frac{16}{32}}$$

↑

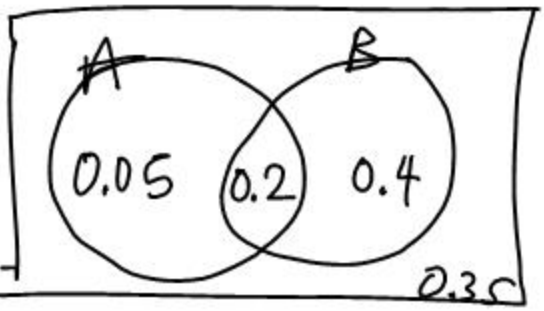
Conditional Probability Formula

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

6J #2 $P(A' \cap B') = 0.35$

(a) $P(A \cap B) = 0.2$

$P(A) = 0.25$ } 0.85
$P(B) = 0.6$ }



(b) $P(A|B) = \frac{P(A \cap B)}{P(B)} = \frac{0.2}{0.6} = \frac{1}{3}$

(c) $P(B'|A') = \frac{P(A' \cap B')}{P(A')} = \frac{0.35}{0.75} = \frac{7}{15}$

Mutually Exclusive Events

These events can't both happen.

Ex. Toss a coin.

A = Heads

B = Tails

$\Big\}$ $P(A \cap B) = 0$

Addition Rule for Mutually Exclusive

$$P(A \cup B) = P(A) + P(B)$$

Ex. $\frac{1}{4}$ of IB students take German

$\frac{1}{3}$ take French

$\frac{1}{3}$ take Spanish.

$\Big\}$ F and S are mutually exclusive

$$P(F \cup S) = \frac{1}{3} + \frac{1}{3} = \frac{2}{3}$$

Independent Events

If A and B are independent events,
then $P(A|B) = P(A)$ and $P(B|A) = P(B)$

Ex. Toss 2 coins.

A = heads on 1st coin

B = heads on 2nd coin

$$P(B|A) = \frac{1}{2} = P(B)$$

Ex. Draw 2 cards (no replacement)

A = 1st card is a spade

B = 2nd card is a spade

$$P(B|A) = \frac{12}{51}$$
$$P(B|A') = \frac{13}{51}$$

} A and B are not independent.

6J #3 - 8

6K #1 - 5

6L #~~2~~ - 4

6L #1