① $A \cup B$ = "la bola extraída o es par o es múltiplo de 3" $= \{2,3,4,6,8,9\}$

$A \cap B$ = " " " " es un nº par múltiplo de 3" $= \{6\}$

$\bar{A} \cup \bar{B}$ = " " " " o es impar o no es múltiplo de 3" $= \{1,2,3,4,5,7,8,9\}$

También:

$\bar{A} \cup \bar{B} = \overline{A \cap B}$ = "la bola extraída no es un nº par múltiplo de 3" $= E - \{6\}$

$\bar{A} \cap B$ = "la bola extraída es un nº par que no es múltiplo de 3" $= \{2,4,8\}$

② $E = \{1,2,3,4,5,6\}$

↑ significa que el mayor de los dos números es el 1.

MAX	1	2	3	4	5	6
1	1	2	3	4	5	6
2	2	2	3	4	5	6
3	3	3	3	4	5	6
4	4	4	4	4	5	6
5	5	5	5	5	5	6
6	6	6	6	6	6	6

X	1	2	3	4	5	6
P	$1/36$	$3/36$	$5/36$	$7/36$	$9/36$	$11/36$

③ $E = \{2,3,4,5,6\}$

SUMA	3	3	3	2	2	1
3	6	6	6	5	5	4
3	6	6	6	5	5	4
3	6	6	6	5	5	4
2	5	5	5	4	4	3
2	5	5	5	4	4	3
1	4	4	4	3	3	2

X	2	3	4	5	6
P	$1/36$	$4/36$	$10/36$	$12/36$	$9/36$

④

	A	$\bar{A}$	
E	12	3	15
$\bar{E}$	3	3	6
	15	6	21

E = "habla español como 1ª lengua"

A = "es argentino"

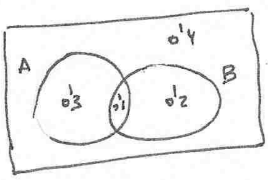
$$P(E/A) = \frac{P(E \cap A)}{P(A)} = \frac{12/21}{15/21} = \frac{12}{15} = \boxed{\frac{4}{5}}$$

También:

$P(E/A) = \frac{12}{15}$ mirando solo la mitad de la tabla →

	A
E	12
$\bar{E}$	3
	15

⑤



$P(A \cup B) = 0'3 + 0'1 + 0'2 = 0'6$

También: $P(A \cup B) = P(A) + P(B) - P(A \cap B) = 0'4 + 0'3 - 0'1 = 0'6$

$$P(A/B) = \frac{P(A \cap B)}{P(B)} = \frac{0'1}{0'3} = \frac{1}{3} = 0'\overline{3}$$

$P(A \cup \bar{B}) = 0'3 + 0'1 + 0'4 = 0'8$

También: $P(A \cup \bar{B}) = P(\overline{\bar{A} \cap B}) = 1 - P(\bar{A} \cap B) = 1 - 0'2 = 0'8$

$P(\bar{A} \cap B) = 0'2$

$$P(\bar{A}/B) = \frac{P(\bar{A} \cap B)}{P(B)} = \frac{0'2}{0'3} = \frac{2}{3} = 0'\overline{6}$$

También: $P(\bar{A}/B) = 1 - P(A/B) = 1 - \frac{1}{3} = \frac{2}{3}$

$$P(B/\bar{A}) = \frac{P(B \cap \bar{A})}{P(\bar{A})} = \frac{0'2}{1 - 0'4} = \frac{0'2}{0'6} = \frac{2}{6} = \frac{1}{3} = 0'\overline{3}$$

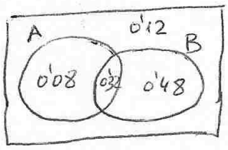
(6) $P(A\cup B) = P(A) + P(B) - P(A\cap B) = P(A)+P(B) - P(A)\cdot P(B/A) = P(A)+P(B) - P(A)\cdot P(B)$

Por ser A y B independientes

$0'88 = 0'4 + P(B) - 0'4\cdot P(B)$

$0'48 = 0'6\, P(B)$

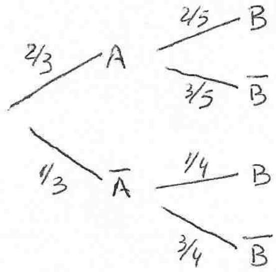
$\frac{0'48}{0'6} = P(B) \longrightarrow \boxed{P(B) = 0'8} \longrightarrow P(A\cap B) = P(A)\cdot P(B) = 0'4 \cdot 0'8 = 0'32$



$P\left((A\cup B) \cap \overline{A\cap B}\right) = 0'08 + 0'48 = \boxed{0'56}$

También $(A\cap \overline{B}) \cup (B\cap \overline{A})$

(7)



$P(B) = \frac{2}{3}\cdot\frac{2}{5} + \frac{1}{3}\cdot\frac{1}{4} = \frac{4}{15} + \frac{1}{12} = \frac{21}{60} = \frac{7}{20}$

$P(B) = \frac{7}{20}$

$P(B|A) = \frac{2}{5}$

$\boxed{\text{B y A son dependientes}}$

$P(\overline{B}) = 1 - \frac{7}{20} = \boxed{\frac{13}{20}}$

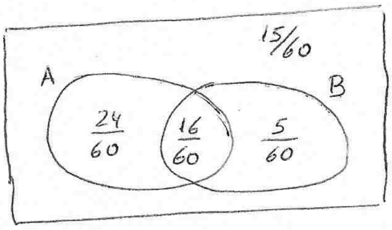
$P(A\cup\overline{B}) = P(A) + P(\overline{B}) - P(A\cap\overline{B}) = P(A) + P(\overline{B}) - P(A)\cdot P(\overline{B}/A) =$

$= \frac{2}{3} + \frac{13}{20} - \frac{2}{3}\cdot\frac{3}{5} = \frac{2}{3} + \frac{13}{20} - \frac{2}{5} = \boxed{\frac{11}{12}}$

También:

$P(B/A) = \frac{P(B\cap A)}{P(A)} \longrightarrow \frac{2}{5} = \frac{P(A\cap B)}{2/3} \longrightarrow P(A\cap B) = \frac{4}{15} = \frac{16}{60}$

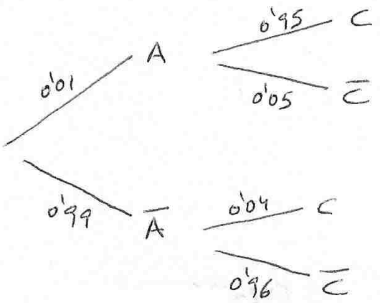
$P(B) = \frac{7}{20} = \frac{21}{60}$ Hecho como antes. $P(A) = \frac{2}{3} = \frac{40}{60}$



$P(\overline{B}) = \frac{24}{60} + \frac{15}{60} = \frac{39}{60} = \frac{13}{20}$

$P(A\cup\overline{B}) = \frac{24}{60} + \frac{16}{60} + \frac{15}{60} = \frac{55}{60} = \frac{11}{12}$

(8)



A = "Tener accidente"

C = "Perder la copa"

a) $P(\overline{A}\cap \overline{C}) = 0'99 \times 0'96 = \boxed{0'9504}$

b) $P(\overline{A}/C) = \frac{P(\overline{A}\cap C)}{P(C)} = \frac{0'99\times 0'04}{0'01\cdot 0'95 + 0'99\cdot 0'04} = \frac{0'0396}{0'0491} = \boxed{0'81}$

c) $P(A/\overline{C}) = \frac{P(A\cap\overline{C})}{P(\overline{C})} = \frac{0'01\cdot 0'05}{0'01\cdot 0'05 + 0'99\cdot 0'96} = \frac{0'0005}{0'9509} = \boxed{0'00053}$

d) $P(C) = 0'01\cdot 0'95 + 0'99\cdot 0'04 = \boxed{0'0491}$

(9) A = Acertar

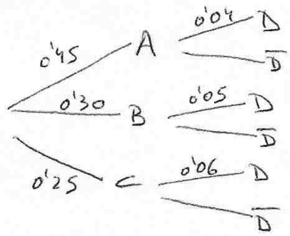
$P(\text{no quedar eliminado}) = P(A) + P(\bar{A})\cdot P(A) + P(\bar{A})\cdot P(\bar{A})\cdot P(A) =$

$= 0'8 + 0'2\cdot 0'8 + 0'2\cdot 0'2\cdot 0'8 = \boxed{0'992}$

También

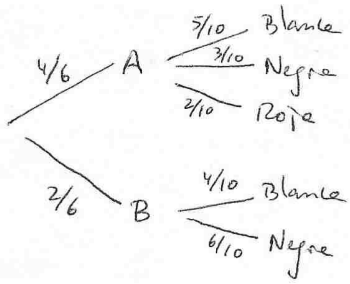
$P(\text{no quedar eliminado}) = 1 - P(\text{quedar eliminado}) = 1 - 0'2\cdot 0'2\cdot 0'2 = 0'992$

(10)



$P(D) = 0'45\cdot 0'04 + 0'30\cdot 0'05 + 0'25\cdot 0'06 = \boxed{0'048}$

(11)



$P(\text{Blanca}) = \frac{4}{6}\cdot\frac{5}{10} + \frac{2}{6}\cdot\frac{4}{10} = \frac{28}{60} = \boxed{\frac{7}{15}}$

$P(\overline{\text{Roja}}) = 1 - P(\text{Roja}) = 1 - \frac{4}{6}\cdot\frac{2}{10} = 1 - \frac{8}{60} = \frac{52}{60} = \boxed{\frac{13}{15}}$

(12) $P = P(M_1)\cdot P(\overline{M_2}/M_1) + P(F_1)\cdot P(\overline{F_2}/F_1) + P(Q_1)\cdot P(\overline{Q}_2/Q_1) =$

$= \frac{4}{12}\cdot\frac{8}{11} + \frac{6}{12}\cdot\frac{6}{11} + \frac{2}{12}\cdot\frac{10}{11} = \frac{88}{132} = \boxed{\frac{2}{3}}$

(13) $P = P\{3\}\cdot P\{3,4,5,6\} + P\{4,5,6\}\cdot P\{3\} = \frac{1}{6}\cdot\frac{4}{6} + \frac{3}{6}\cdot\frac{1}{6} = \boxed{\frac{7}{36}}$

También:

MENOR	1	2	3	4	5	6
1	1	1	1	1	1	1
2	1	2	2	2	2	2
3	1	2	3	3	3	3
4	1	2	3	4	4	4
5	1	2	3	4	5	5
6	1	2	3	4	5	6

(14) $P = \frac{13}{20}\cdot\frac{12}{19}\cdot\frac{11}{18}\cdot\frac{10}{17} = \frac{143}{969} = \boxed{0'15}$

(15) $P = \binom{7}{2}\left(\frac{1}{4}\right)^2\left(\frac{3}{4}\right)^5 = 21\cdot\frac{243}{16384} = \boxed{0'31}$

(16) $\frac{2}{3} < P[\text{dar en el blanco al menos una vez}] = 1 - P[\text{no acertar ninguna}]$

$P(\text{no acertar ninguna}) < 1 - \frac{2}{3} = \frac{1}{3}$

n intentos $\left(\frac{3}{4}\right)^n < \frac{1}{3}$

$n=1 \rightarrow \left(\frac{3}{4}\right)^1 \not< \frac{1}{3}$

$n=2 \rightarrow \left(\frac{3}{4}\right)^2 \not< \frac{1}{3}$

$n=3 \rightarrow \left(\frac{3}{4}\right)^3 \not< \frac{1}{3}$

$n=4 \rightarrow \left(\frac{3}{4}\right)^4 < \frac{1}{3} \rightarrow \boxed{4 \text{ veces}}$

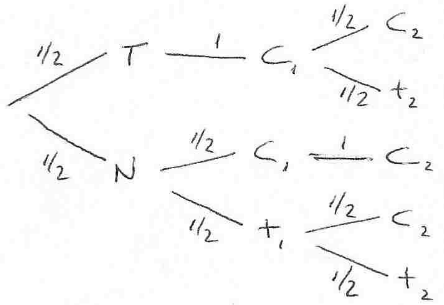
También: $\log\left(\frac{3}{4}\right)^n < \log(1/3) \rightarrow n\log(3/4) < \log(1/3) \rightarrow n > \frac{\log(1/3)}{\log(3/4)} = 3'82 \rightarrow \boxed{n=4}$

(17) a) $P = 3 \times \frac{2}{3} \times \frac{2}{3} \times \frac{1}{3} \times 2 \times \frac{3}{4} \times \frac{1}{4} = \boxed{\frac{1}{6}} = 0'1\widehat{6}$

b) $P = \left(\frac{1}{3}\right)^3 \cdot \left(\frac{1}{4}\right)^2 + 3 \cdot \left(\frac{1}{3}\right)^2 \cdot \frac{2}{3} \times 2 \cdot \frac{1}{4} \times \frac{3}{4} + 3 \times \frac{1}{3} \times \left(\frac{2}{3}\right)^2 \times \left(\frac{3}{4}\right)^2 =$

$= \frac{1}{432} + \frac{36}{432} + \frac{108}{432} = \frac{145}{432} = \boxed{0'34}$

(18)

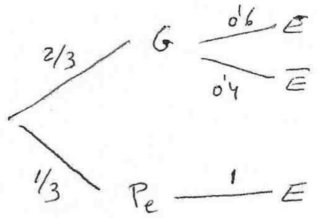


T = "elegir moneda Trucada"
N = " " " normal"
C = "Salir Cara"
+ = "Salir Cruz"

$P(C_2) = \frac{1}{2} \times 1 \times \frac{1}{2} + \frac{1}{2} \times \frac{1}{2} \times 1 + \frac{1}{2} \times \frac{1}{2} \times \frac{1}{2} = \frac{1}{4} + \frac{1}{4} + \frac{1}{8} = \boxed{\frac{5}{8}} = 0'625$

$P(C_1/C_2) = \frac{P(C_1 \cap C_2)}{P(C_2)} = \frac{1/2 \cdot 1 \cdot 1/2 + 1/2 \times 1/2 \cdot 1}{\frac{5}{8}} = \frac{\frac{1}{4} + \frac{1}{4}}{\frac{5}{8}} = \boxed{\frac{4}{5}} = 0'8$

(19)

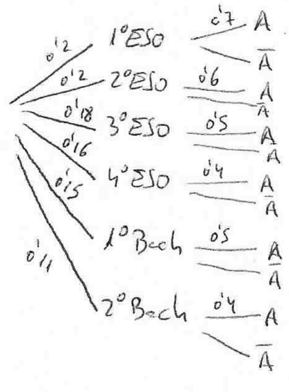


G = "ir en el autobus grande"
P_e = " " " " " pequeño"
E = "Saber esquiar"

$P(E) = \frac{2}{3} \cdot 0'6 + \frac{1}{3} = \boxed{\frac{11}{15}} = 0'7\widehat{3}$

$P(P_e/E) = \frac{P(P_e \cap E)}{P(E)} = \frac{1/3 \times 1}{11/15} = \boxed{\frac{5}{11}} = 0'\widehat{45}$

(20)



$P(A) = 0'2 \cdot 0'7 + 0'2 \times 0'6 + 0'18 \cdot 0'5 + 0'16 \cdot 0'4 + 0'15 \cdot 0'5 + 0'11 \cdot 0'4 = \boxed{0'533}$

$P(1^o Bach / A) = \frac{P(1^o Bach \cap A)}{P(A)} = \frac{0'15 \times 0'5}{0'533} = \frac{0'075}{0'533} = \boxed{0'14}$

(21) $P(A) = \frac{80}{210} = \boxed{0'38}$

$P(B) = \frac{100}{210} = \boxed{0'48}$

$P(A/B) = \frac{P(A \cap B)}{P(B)} = \frac{35/210}{100/210} = \frac{35}{100} = 0'35 \longrightarrow$ $\boxed{\text{A y B son dependientes}}$

$P(\overline{B}/H) = \frac{P(\overline{B} \cap H)}{P(H)} = \frac{50/210}{85/210} = \frac{50}{85} = \boxed{0'588}$

$P((B_1 \cap \overline{B_2}) \cup (\overline{B_1} \cap B_2)) = \frac{110}{210} \times \frac{100}{209} \times 2 = \boxed{0'501}$