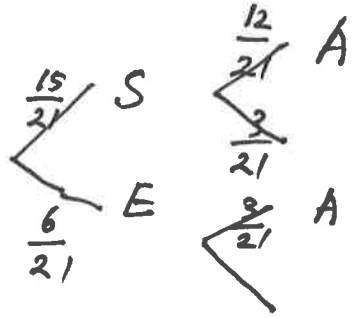
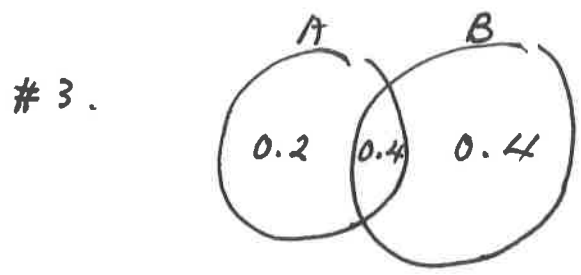


probability part 2B Exam Questions (Solutions)

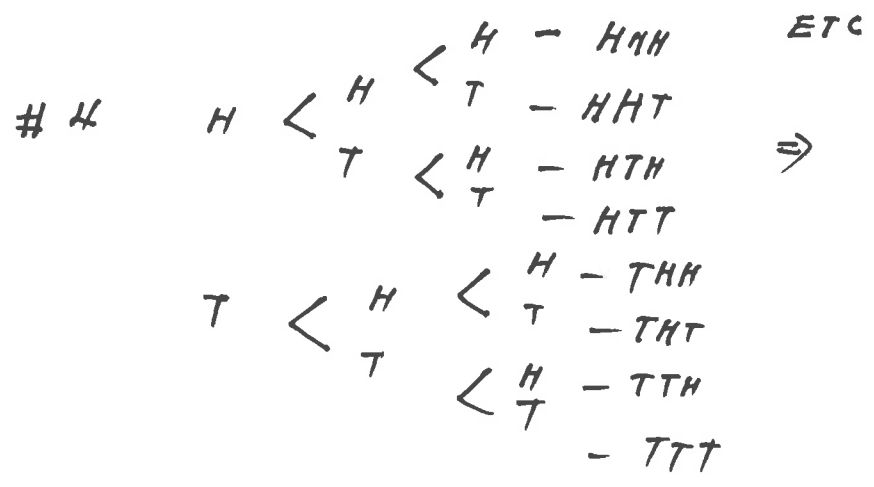
#1. $\left(\frac{4}{9}\right)\left(\frac{3}{8}\right) + \left(\frac{3}{9}\right)\left(\frac{4}{8}\right) = \frac{1}{3}$

#2.  $\Rightarrow \frac{\left(\frac{15}{21}\right)\left(\frac{12}{21}\right)}{\left(\frac{15}{21}\right)\left(\frac{12}{21}\right) + \left(\frac{6}{21}\right)\left(\frac{3}{21}\right)} = P(S|A)$
 $= \left(\frac{4}{5}\right)$



(a) $P(A \cap B) = 0.4$

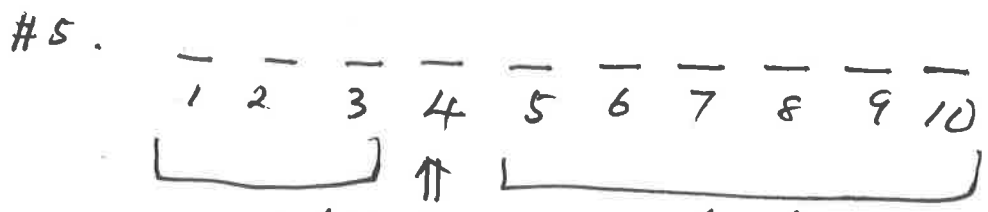
(b) $P(A' \cup B') = 0.2 + 0.4 = 0.6$



(a) $8C_4 \left(\frac{1}{2}\right)^8 = P(4H)$
 $= \frac{70}{256}$

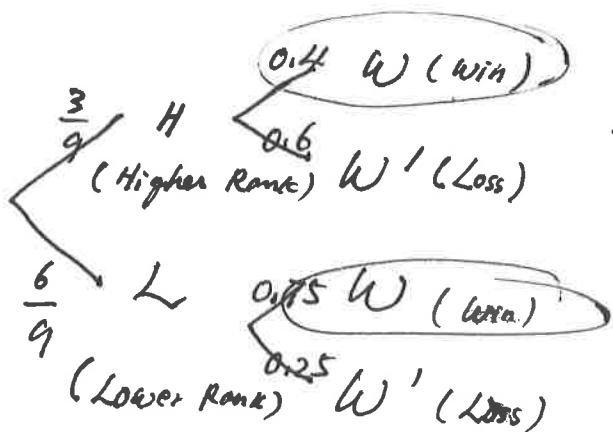
(b) $8C_3 \left(\frac{1}{2}\right)^8 = P(3H)$
 $= \frac{56}{256}$

(c) $[8C_3 + 8C_4 + 8C_5] \left(\frac{1}{2}\right)^8$
 $= \frac{182}{256}$



\Rightarrow Next page.

#5. Tree Diagram

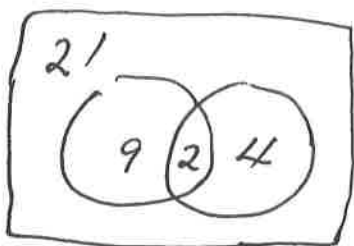


$$\Rightarrow P(W) = \left(\frac{3}{9}\right)(0.4) + \left(\frac{6}{9}\right)(0.75)$$

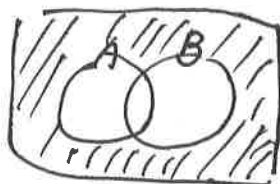
$$= \left(\frac{1}{3}\right)\left(\frac{2}{5}\right) + \left(\frac{2}{3}\right)\left(\frac{3}{4}\right)$$

$$= \frac{19}{30}$$

#6.



(a)



$$(A \cup B)' = 21.$$

(b) (i) $n(A \cap B) = \boxed{2}$.

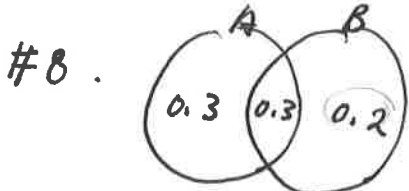
(ii) $P(A \cap B) = \frac{2}{36} = \boxed{\frac{1}{18}}$

#7.

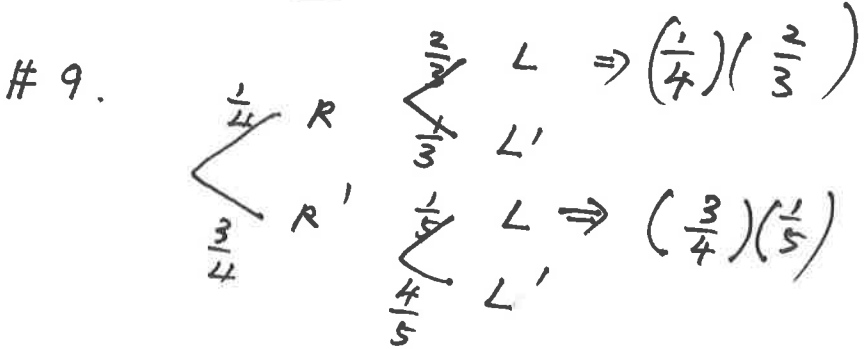
(a) 25%

(b) 75%

(c) 170 cm

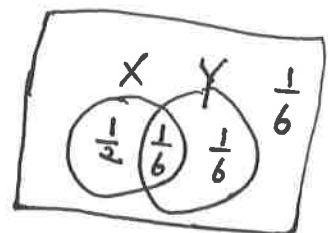


$$P(A \cup B) = \boxed{0.8}$$



$$\Rightarrow P(R/L) = \frac{(\frac{1}{4})(\frac{2}{3})}{(\frac{1}{4})(\frac{2}{3}) + (\frac{3}{4})(\frac{1}{5})} = \boxed{\frac{10}{19}}$$

#10. (a) $P(Y') = (1 - \frac{1}{3}) = \boxed{\frac{2}{3}}$



(b) $P(X' \cup Y') = 1 - \frac{1}{6} = \boxed{\frac{5}{6}}$

$$P(X \cap Y) = (\frac{1}{4})(\frac{2}{3}) = \frac{1}{6}$$

#11.

$$\frac{L \cdot L' \quad L \cdot \quad L' \cdot L}{(\frac{1}{3})(\frac{2}{3}) \quad (\frac{1}{3}) \quad (\frac{2}{3})(\frac{1}{3})} = \frac{(\frac{2}{3})(\frac{1}{3})}{(\frac{2}{3})(\frac{1}{3}) + (\frac{1}{3})(\frac{3}{3})} = \boxed{\frac{2}{5}}$$

probability Questions (From past IB Exams)

④

12 (a) $\frac{21}{36}$ (b) $\frac{11}{36}$ (c) $\frac{7}{21}$

	1	2	3	4	5	6
1	(1,1) =2	(1,2) =3	(1,3) =4	(1,4) =5	(1,5) =6	(1,6) =7
2	(2,1) =3	(2,2) =4	(2,3) =5	(2,4) =6	(2,5) =7	(2,6) =8
3	(3,1) =4	(3,2) =5	(3,3) =6	(3,4) =7	(3,5) =8	(3,6) =9
4	(4,1) =5	(4,2) =6	(4,3) =7	(4,4) =8	(4,5) =9	(4,6) =10
5	(5,1) =6	(5,2) =7	(5,3) =8	(5,4) =9	(5,5) =10	(5,6) =11
6	(6,1) =7	(6,2) =8	(6,3) =9	(6,4) =10	(6,5) =11	(6,6) =12

13, Total out come $36 \times 36 = 1296$

(a) (i) $\frac{4}{36} = \frac{1}{9}$

(ii) $\frac{4}{36} \times \frac{4}{36} = \frac{1}{81}$

(b) (i) $\left(\frac{1}{36}\right)\left(\frac{1}{36}\right) + \left(\frac{2}{36}\right)\left(\frac{2}{36}\right) + \left(\frac{3}{36}\right)\left(\frac{3}{36}\right) + \left(\frac{4}{36}\right)\left(\frac{4}{36}\right) \dots = \frac{146}{1296} \approx \frac{73}{648}$

(ii) Not having the same score $\left(1 - \frac{146}{1296}\right)$

Alan Exceeding $\Rightarrow \frac{1}{2} \left(1 - \frac{146}{1296}\right)$

Belle's score

$\left(\frac{19}{216}\right)$

(c)

X	1	2	3	4	5	6
P(X=x)	$\frac{1}{1296}$	$\frac{15}{1296}$	$\frac{65}{1296}$	$\frac{175}{1296}$	$\frac{369}{1296}$	$\frac{671}{1296}$

(d) $E(X) = (1)\left(\frac{1}{1296}\right) + (2)\left(\frac{15}{1296}\right) + (3)\left(\frac{65}{1296}\right) + (4)\left(\frac{175}{1296}\right) + (5)\left(\frac{369}{1296}\right) + (6)\left(\frac{671}{1296}\right)$

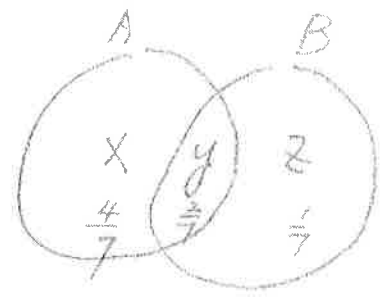
14

(a) $\frac{2}{3}$

(b) $\binom{3}{1} \binom{3}{2} = \frac{2}{9}$

(c) $\frac{\frac{4}{6}}{1 - (\frac{4}{36})} = \frac{\frac{4}{6}}{\frac{32}{36}} = \frac{4}{6} \cdot \frac{36}{32} = \frac{2}{4}$

15



$\frac{\frac{1}{7}}{\frac{3}{7}} = \frac{1}{3}$

$P(A) = \frac{6}{7} = X + Y$

$P(D|B) = \frac{P(D \cap B)}{P(B)} = \frac{Z}{Y + Z} = \frac{1}{3} \Rightarrow Z = \frac{1}{3}Y + \frac{1}{3}Z$

$X + Y + Z = 1$

$Y = \frac{2}{7}$
 $Z = \frac{1}{2}(\frac{2}{7}) = \frac{1}{7}$

$P(B) = Y + Z = \frac{2}{7} + \frac{1}{7} = \frac{3}{7}$