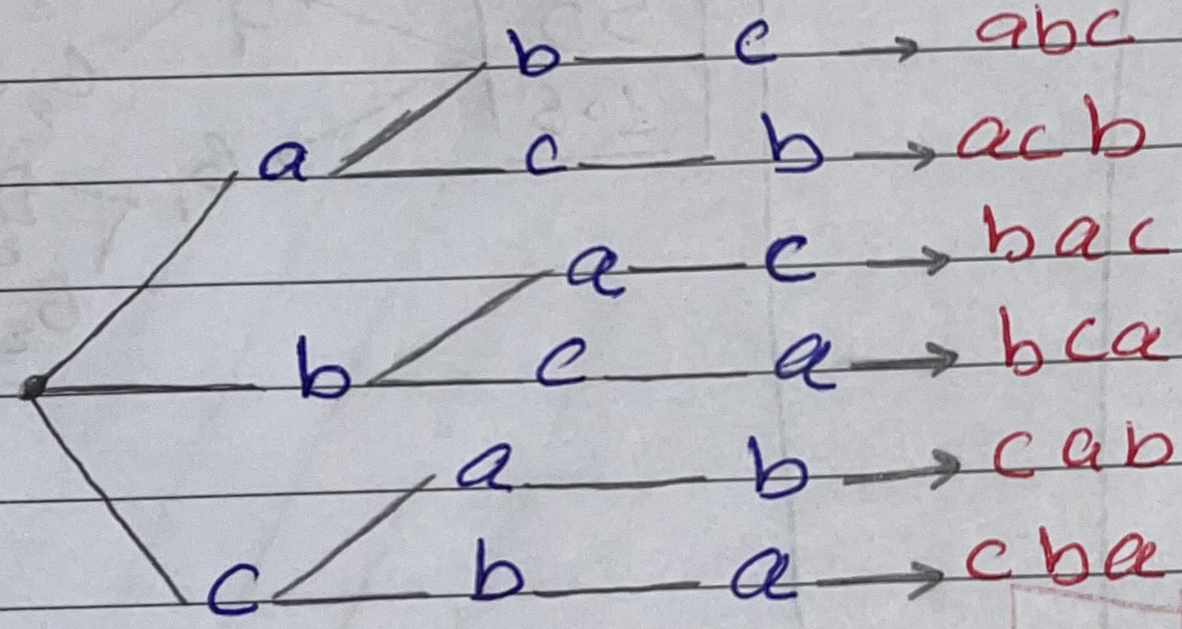
التاريخ: / /

الموضوع:

HW2

1 $\binom{12}{4} * \binom{8}{4} * \binom{4}{4} = 34650$ #

2

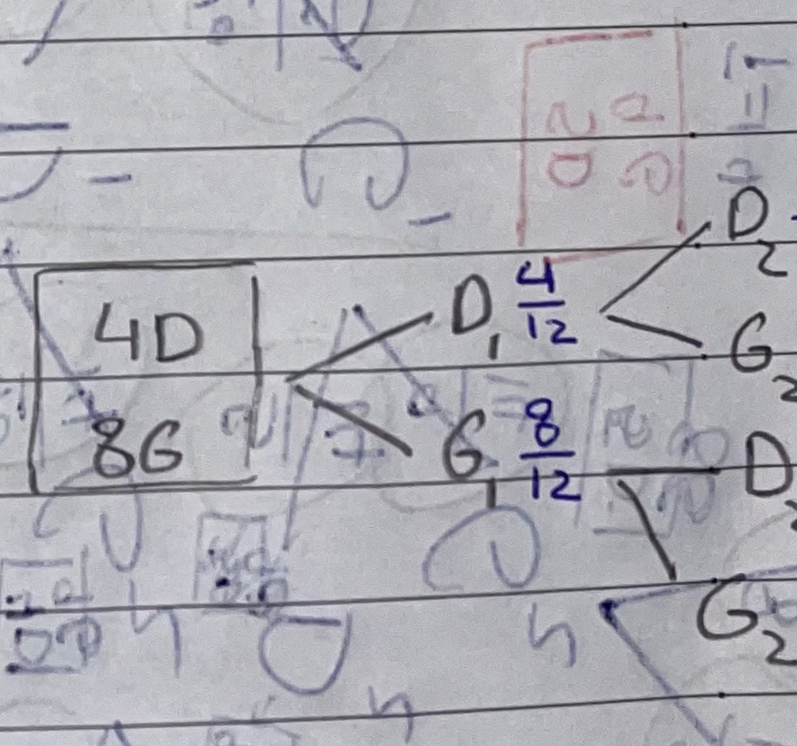


3 (i) $P(A) = \left(\frac{4}{12}\right) * \left(\frac{3}{11}\right) = \frac{1}{11}$ #

$P(B) = \left(\frac{8}{12}\right) * \left(\frac{7}{11}\right) = \frac{14}{33}$ #

(ii)

P(atleast one item is defective)



$= \cancel{\left(\frac{4}{12} \times \frac{7}{}\right.} = \left(\frac{4}{12} \times \frac{3}{11}\right) + \left(\frac{4}{12} \times \frac{8}{11}\right)$

$+ \left(\frac{8}{12} \times \frac{4}{11}\right) = \frac{19}{33}$ #

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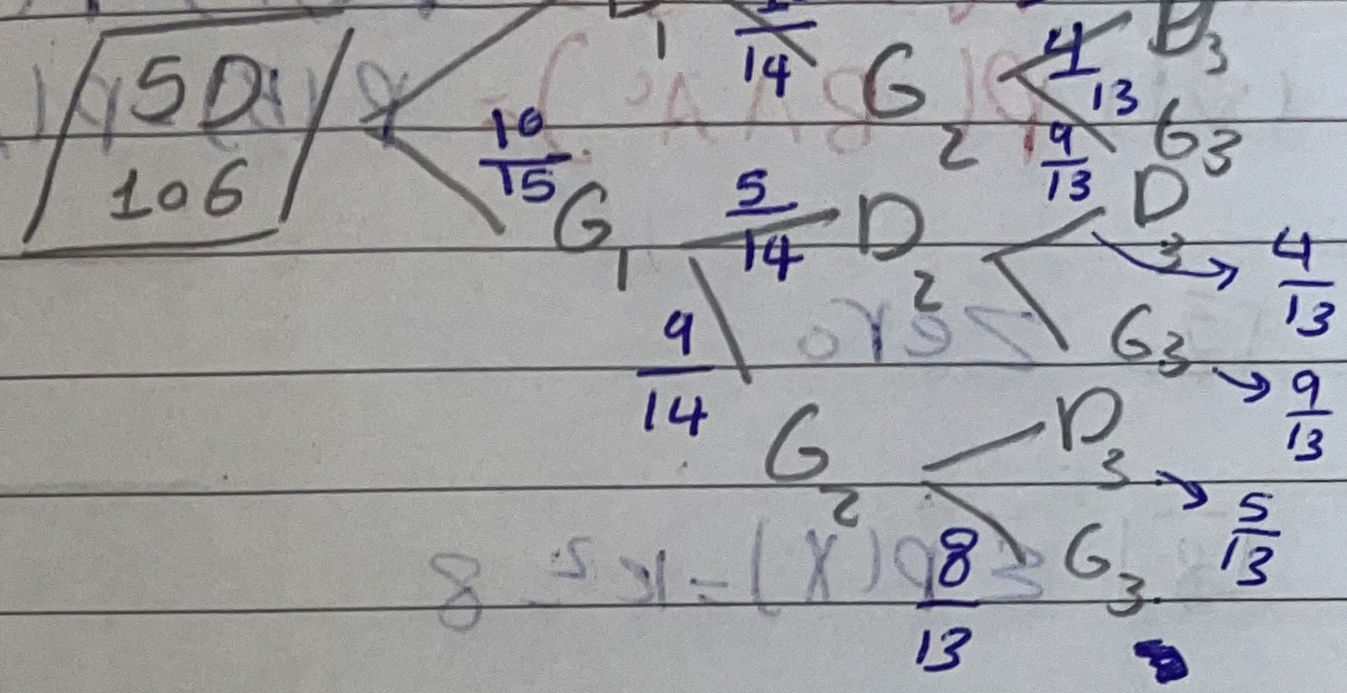
4 (i) $\frac{10}{15} \times \frac{9}{14} \times \frac{8}{13}$

$= \frac{24}{91}$

(ii) $\left(\frac{5}{15} \times \frac{10}{14} \times \frac{9}{13}\right) + \left(\frac{10}{15} \times \frac{5}{14} \times \frac{9}{13}\right) + \left(\frac{9}{14} \times \frac{10}{15} \times \frac{5}{13}\right) = \frac{45}{91}$

(iii) $1 - \left(\frac{10}{15} * \frac{9}{14} * \frac{8}{13}\right)$

$= \frac{67}{91}$



5

	From mums	Not From mums	
boys	5	5	10
girls	10	10	20
Total →	15	15	30

$P(B \cup M) = P(B) + P(M) - P(B \cap M)$

$= \frac{10}{30} + \frac{15}{30} - \frac{5}{30} = \frac{2}{3}$ #

6 $P(A) = \frac{3}{8}$, $P(B) = \frac{1}{2}$, $P(A \cap B) = \frac{1}{2}$

(i) $P(A^c) = 1 - P(A) = 1 - \frac{3}{8} = \frac{5}{8}$

(ii) $P(B^c) = 1 - P(B) = 1 - \frac{1}{2} = \frac{1}{2}$

(iii) $P(B^c \cap A^c) = 1 - P(B \cup A) = 1 - \left(\frac{3}{8} + \frac{1}{2} - \frac{1}{2}\right) = \frac{5}{8}$

$= 1 - \frac{3}{8} = \frac{5}{8}$

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(iv) $P(\bar{A} \cup \bar{B}) = \cancel{P(B}\ 1 - P(A \cap B) = 1 - \frac{1}{2} = \frac{1}{2}$

(v) $P(A \cap \bar{B}) = P(A) - P(A \cap B) = \frac{3}{8} - \frac{1}{2}$

(vi) $P(B \cap A^c) = P(B) - P(A \cap B)$

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[7] zero

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[8] $\sum P(X) = k^2 - 8$

$1 = k^2 - 8 \Rightarrow k^2 = 1 + 8 = 9$

$k = 3$

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[9] $P(A) = 0.35$, $P(B) = 0.45$

$P(\bar{A} \cap \bar{B}) = 1 - P(A \cup B) = 1 - (0.35 + 0.45)$