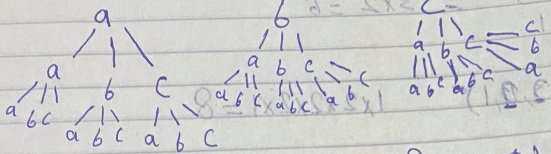
Date:

HW2

(1) $n=12$, $r=3$ $= \frac{12!}{9!\cdot 3!} = 220$

(2) $3!$



(3) i) $P(A) = \frac{4}{12} \times \frac{4}{12} = \frac{16}{199}$

4 are defective

8 are not detective

$P(B) = \frac{8}{12} \times \frac{8}{12} = \frac{64}{199}$

$P(\text{at least one}) = 1 - \frac{64}{199}$

(4) 5 are defective

10 arent defective

i) $= \frac{10}{15} \times \frac{10}{15} \times \frac{10}{15} = \frac{8}{27}$

ii) $= \frac{5\times10\times10}{15\times15\times15} \times 3$

$= \frac{15}{15} \times \frac{10}{15} \times \frac{10}{15} = \frac{4}{9}$

iii) $1 - \frac{8}{27} = \frac{19}{27}$

5) $P(\text{boys}) = \frac{10}{30}$

$P(\text{girls}) = \frac{20}{30}$

$P(\text{Mansora}) = \frac{15}{30}$

$P(\text{Not Mansoura}) = \frac{15}{30}$

$P(\text{Not Girl and not from mansora}) = \frac{20\times15}{30\times30} = \frac{1}{3}$

$P(\text{boy or from mansoura}) = 1 - \frac{1}{3} = \frac{2}{3}$

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

i) $p(A') = 1 - \frac{3}{8} = \frac{5}{8}$

ii) $p(B') = 1 - \frac{1}{2} = \frac{1}{2}$

iii) $p(A' \cap B') = 1 - (A \cup B) = 1 - (\frac{3}{8} + \frac{1}{2} - \frac{1}{8})$

$= \frac{5}{8}$

$p(A') = \frac{5}{8}$

$p(B) = \frac{1}{2}$ $p(A' \cap B) = \frac{1}{8}$

$p(A' \cup B) = \frac{5}{8} + \frac{1}{2} - \frac{1}{8} = \frac{5}{8} + \frac{4}{8} - \frac{1}{8} = 1$

iv) $p(A' \cup B') = p(A') = \frac{5}{8}$

v) $p(A \cap B') = 0$

vi) $p(B \cap A') = \frac{1}{8}$

7)

$S = 6^3$

roll $7 = 6$

$\frac{6}{36} = \frac{1}{6}$ $p(\text{not } 7) = \frac{5}{6} \times \frac{5}{6} =$

$p(7) = 1 - \frac{125}{216}$

(8) $\Sigma p(x) = 1$ $\boxed{k = 3}$

$k^2 - 8 = 1$

$k^2 = 9$

(9) $p(A) = 0.35$ $p(B) = 0.95$

$p(A \cup B) = 0.35 + 0.95 = 0.8$

$p(A' \cap B') = 1 - (A \cup B) = 1 - 0.8 = 0.2$