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dept: S.W

Date: Subject: HW2

Solve the following problems:

1) 12 items - 3 = افتراض - test per 4 student

\* الترتيب ليس مهم

$$12C_4 \times 8C_4 \times 4C_4$$

$$\frac{12}{8! \cdot 4!} \times \frac{8!}{4! \cdot 4!} \times 1 = 34650 \times$$

2).

$$\begin{array}{l} a \begin{cases} ab - abc \\ ac - acb \end{cases} \\ b \begin{cases} ba - bac \\ bc - bca \end{cases} \\ c \begin{cases} ca - cab \\ cb - cba \end{cases} \end{array}$$

$$\begin{aligned} 3P_3 &= \frac{n!}{(n-r)!} \\ &= \frac{3!}{0!} \\ &= 2 \times 3 \times 6 \times \end{aligned}$$

$$3) P(A) = \frac{4C_2}{12C_2} = \frac{1}{11}$$

$$P(B) = \frac{8C_2}{12C_2} = \frac{14}{33}$$

P(at least one item is defective)

$$2\left(1 - \frac{14}{33}\right) = \frac{19}{33}$$

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4) 15 items - 5 defective. 10 non-defective. Select 3 items

i) Three items non-defective

$$10C_3 \div 15C_3 = \frac{24}{91}$$

ii) One item of three items is defective

$$\frac{5C_1 \times 10C_2}{15C_3} = \frac{45}{91}$$

iii) At least one of items is defective

$$1 - \frac{24}{91} = \frac{67}{91}$$

5)  $P(A \cup B) = P(A) + P(B) - P(A \cap B)$

$P(A) \rightarrow$  boy

$P(B) \rightarrow$  man South

$$P(A) = \frac{10}{30} = \frac{1}{3}$$

$$P(B) = \frac{15}{30} = \frac{1}{2}$$

$$P(A \cap B) = \frac{5}{30} = \frac{1}{6}$$

$$P(A \cup B) = \frac{1}{3} + \frac{1}{2} - \frac{1}{6} = \frac{2}{3} \quad \text{※}$$

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

$$\text{i)} P(A^c) = 5/8 \quad \text{ii)} P(B^c) = \frac{1}{2}$$

$$\text{iii)} P(A^c \cap B^c) = P(A \cup B) \rightarrow \text{De'Morgan}$$

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

$$= \frac{3}{8} + \frac{1}{2} - \frac{1}{2} = \frac{3}{8}$$

$$P(A^c \cup B^c) = P(A \cap B) = \frac{1}{2}$$

7) Pair of die  $\rightarrow$  3 times at least you roll a 7?

$$\frac{1}{6} \times \frac{1}{6} = \frac{1}{36} \quad \frac{1}{6}$$

$$\frac{1}{6} \times \frac{1}{6} \times \frac{1}{6} = \frac{1}{216}$$

$$= \frac{1}{216} + \frac{1}{6} + \frac{1}{36} = \frac{43}{216}$$

$$8) \sum P(x) = k^2 - 8$$

$$1 = k^2 - 8$$

$$k^2 = 9$$

$$k = \pm 3$$

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9) A, B mutually exclusive  $P(A) = 0,35$

$$P(B) = 0,45 \quad P(A' \cap B') = P(A \cup B)$$

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

$$= 0,45 + 0,35 = 0,8 \times$$

