Name :

Id :

major :

Level :

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20231700208

A1

II

Question (1) :

(a) Using factoria → $8! = 40320$

(b) $2! \cdot 7! = 10080$ why ~~~~~~~~~ →we can start with men or women

(c) $4 \times 4 \times 3 \times 3 \times 2 \times 2 = 576 \times 2 = 1152$

(d) $4! \times 5! = 2880$

(e) $4! \times (2!)^4 = 384$ □□ × □□ × □□ × □□

Question (2) :

(a) $(1+2+3)! = 720$ way

(b) $3! \cdot 3! \cdot 2! = 72$ □□□ □□ □
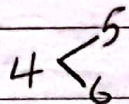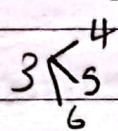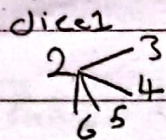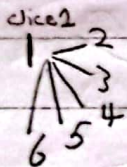
(c) $3! \cdot 4! = 144$ □□□ □ □ □

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Question (3):

(a) $P(A \cup B) = P(A) + P(B) = 0.3 + 0.5 = 0.8$

(b) $P(A \cap B') = P(A) = 0.3$

(C) $P(A \cap B) = 0$ $\rightarrow$ mutually exclusive

Question (4):

Sample space: $6 \times 6 = 36$ Possible outcome
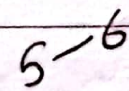
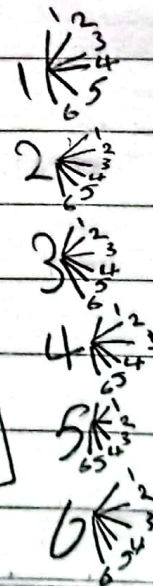
$$P(A) = \frac{15}{36} = \frac{5}{12}$$

Question (5):

at least one land on $6 \rightarrow A$

dice land on diff num $\rightarrow B$

$\therefore P(A) = 6 \cdot 2 = 12 - 1 = \frac{11}{36}$

double count of (6,6)

$\therefore P(B) = \frac{30}{36}$

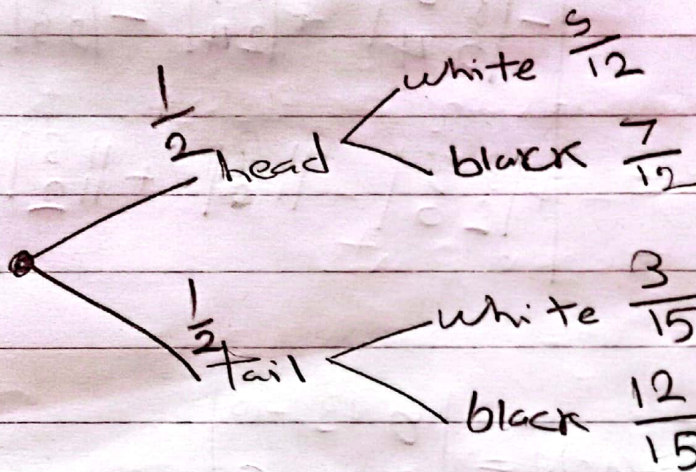$\therefore P(A/B) = \frac{P(A \cap B)}{P(B)} = \frac{\frac{10}{36}}{\frac{30}{36}} = \boxed{\frac{1}{3}}$

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Q6:

$$P(T/w) = \frac{P(t \cap w)}{P(w)} = \frac{P(w/t) \cdot P(t)}{P(w)}$$

$$\rightarrow P(T/w)$$

$$\frac{P(w/t) \cdot P(t)}{P(w)}$$

$$\frac{1}{2} \text{ head} \begin{cases} \text{white } \frac{5}{12} \\ \text{black } \frac{7}{12} \end{cases}$$

$$\frac{1}{2} \text{ tail} \begin{cases} \text{white } \frac{3}{15} \\ \text{black } \frac{12}{15} \end{cases}$$

$$P(t/w) = \frac{(\frac{3}{15} \times \frac{1}{2}) \times \frac{1}{2}}{\frac{1}{2}(\frac{5}{12} \times \frac{1}{2}) + \frac{1}{2}(\frac{3}{15} \times \frac{1}{2})} = 0.324$$