

HOME WORK 1

1. (3.7.1)

$A = \{\text{quartz specimens are found}\}$

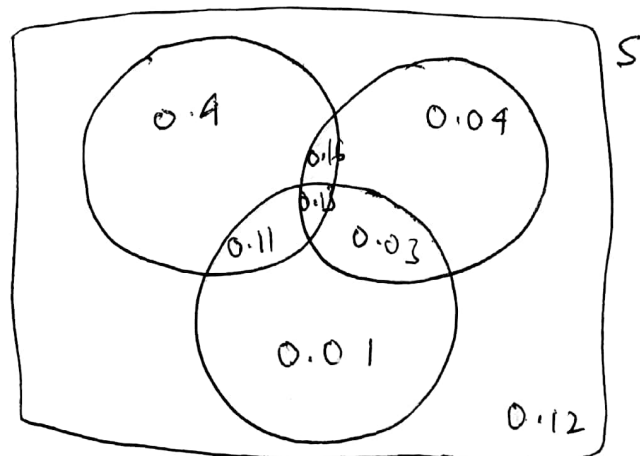
$B = \{\text{tourmaline specimens are found}\}$

$C = \{\text{aquamarine specimens are found}\}$

$$P(A) = 0.80, P(B) = 0.36, P(C) = 0.28, P(A \cap B) = 0.29$$

$$P(A \cap C) = 0.24, P(B \cap C) = 0.16, P(A \cap B \cap C) = 0.13$$

a



$$b) P(A \cap B) - P(A \cap B \cap C) = 0.29 - 0.13 = 0.16$$

$$c) P(A) - \{P(A \cap C) + P(A \cap B) - P(A \cap B \cap C)\}$$

$$= 0.8 - (0.24 + 0.29 - 0.13) = 0.4$$

$$d) S - P(A \cup B \cup C) = 1 - 0.88 = 0.12$$

$$e) P(A^c \cap (B \cup C)) = P((A^c \cap B) \cup (A^c \cap C))$$

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

$$= 0.07 + 0.04 - 0.03 = 0.08$$

2. (3.7.5)

$$a) 6^4$$

$$b) \frac{6 \times 5 \times 4 \times 3}{6^4} = \frac{5 \times 4 \times 3}{6 \times 3 \times 3} = \frac{5}{18}$$

$$c) \frac{4}{6^4} \binom{6^4}{1 \ 1 \ 1 \ 2}$$

$$d) 1 - \text{all faces even}$$

$$= 1 - \left(\frac{3}{6}\right)^4 = 1 - \left(\frac{1}{2}\right)^4 = 1 - \frac{1}{16}$$

$$e) \frac{3 \times 1 \times 1 \times 3 \times 4}{6^4} = \frac{15}{16}$$

$$= \frac{36}{6^4} = \frac{1}{36}$$

3. (3.7.6)

$$\textcircled{a} \left(\frac{1}{4}\right)^5 \times \left(\frac{1}{4}\right)^5 \times \frac{10!}{5!5!}$$

$$\textcircled{b} \left(\frac{2}{4}\right)^{10} = \left(\frac{1}{2}\right)^{10}$$

$$\textcircled{c} \left(\frac{2^{10}-2}{4^{10}}\right) \times 6$$

$$\textcircled{d} \left(\frac{2^{10}-2}{4^{10}}\right) \times 6 + \left(\frac{1}{4}\right)^{10} \times 4$$

$$4. \textcircled{a} \frac{20}{40} \times \frac{19}{39} \times \frac{18}{38} \times \frac{17}{37} \times \frac{16}{36} \times \frac{15}{35}$$

\textcircled{b} The game couldn't be rigged because however small there is a probability of that it could happen which satisfies $0 < P(E) < 1$.