

ASIA SANSU OLYMPICS(ASO) - SENIOR

8th October 2023

Trial Round, “**SENIOR**” Level



Instructions

- Do not open problem paper before getting permission
- Write down your answers in the blank provided in answer sheet. Anything located outside blank will not be considered.
- Any question related to problem content or meaning is not allowed except missing typing.
- If student is in bad condition, please raise your hand and inform jury.
- Exit from examination room before time up is prohibited.
- When the time is up, put down pencil immediately and leave answer sheet on the table before leaving room.

Examination period 90 minutes

[Question 1]

Fill a number from 0 to 9 in $\square$ to complete the multiplication below.

$$\begin{array}{r}
 20\square \\
 \times \square\square 2 \\
 \hline
 \square\square\square \\
 \square 0\square\square \\
 \square\square\square \\
 \hline
 3\square 1\square\square
 \end{array}$$

[Question 2]

There are 7 white and 7 black cards. Each card has a number 0 to 6 written on its front. Remove 2 white and 2 black cards and arrange the remaining 10 cards face down according to the following rules;

[Rule 1] Arrange the cards from left to right in ascending order of numbers.

[Rule 2] In case the white card and black card have the same number, place the black card to the left of the white card.

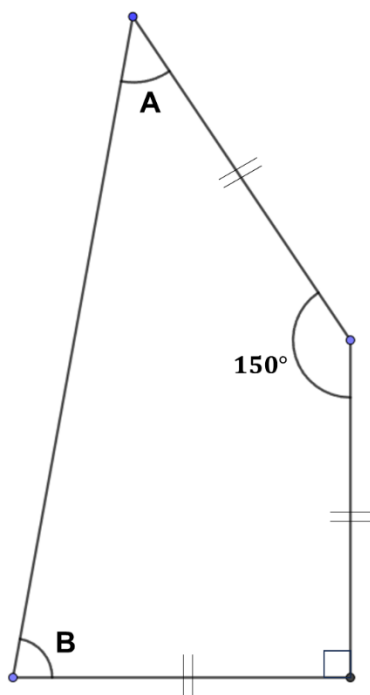
The 10 cards are arranged as shown in the figure.



What are the numbers written on each of the first 2 white and 2 black cards removed?

[Question 3]

Find the missing angles A and B in the figure below.



[Question 4]

Four students (A, B, C and D) took a “✓ or ✗” (True or False) test consisting of 10 questions. The results of the test are shown in the following table. Score of each question is 10 points. What is the total score of student D?

Student	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Total score
A	✓	✗	✓	✗	✓	✓	✗	✗	✗	✓	70
B	✓	✓	✗	✗	✗	✓	✓	✓	✗	✗	70
C	✗	✗	✗	✓	✓	✗	✓	✗	✓	✗	60
D	✓	✓	✗	✗	✓	✗	✓	✗	✗	✗	?

[Question 5]

Yoshiko is playing with matches having the same size. She makes squares whose side is one match and arranges them. If she arranges all matches as shown in **Figure 1**, then she can make 28 squares.



Figure 1

(1) If Yoshiko arrange all matches as shown in **Figure 2**, how many squares can she make?

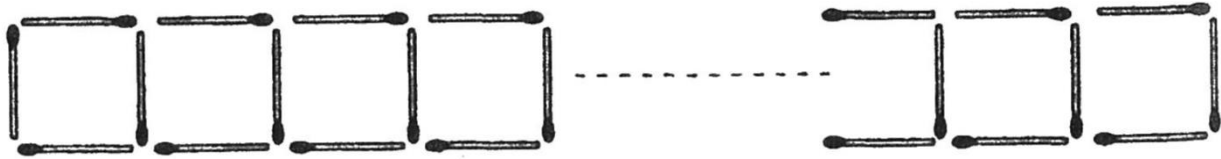


Figure 2

(2) If Yoshiko arrange all matches as shown in **Figure 3**, how many squares can she make?

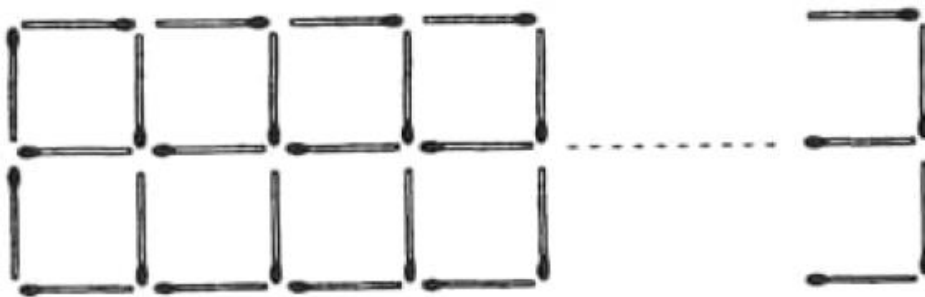
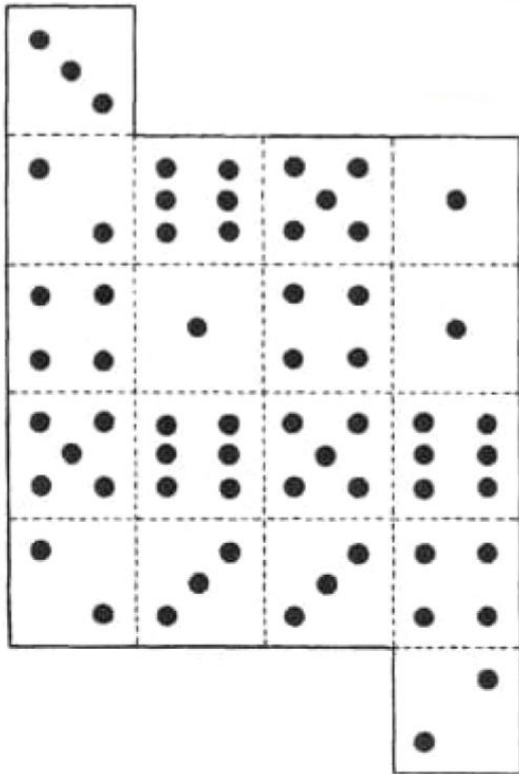


Figure 3

(3) What is the maximum number of squares she can make?

[Question 6]

The sum of the numbers on opposite faces of dice is 7. Draw lines to cut out the unfold diagram of dice to make two dice. Note that, the adjacent dice faces in unfold diagram of dice must have the common side to make the dice.





[Question 7]

There are 10 cards with the number 0 to 9 written on each of them. Remove some cards from the pile and place the remaining cards in a row horizontally. It is found that

- Summation of the numbers on cards from the most left to 7th card from left is 22.
- Summation of the numbers on cards from the most right to 6th card from right is 35.

How many cards were removed initially and what is/are the number of removed card(s)?



[Question 8]

Yoshiko bought some fruits at the supermarket. At least, one of each fruit was bought and the total price she paid is 3600 Yen.

The price of each apple is 130 Yen.

The price of each mango is 78 Yen.

The price of each papaya is 170 Yen.

The price of each watermelon is 104 Yen.

How many papayas did Yoshiko buy?

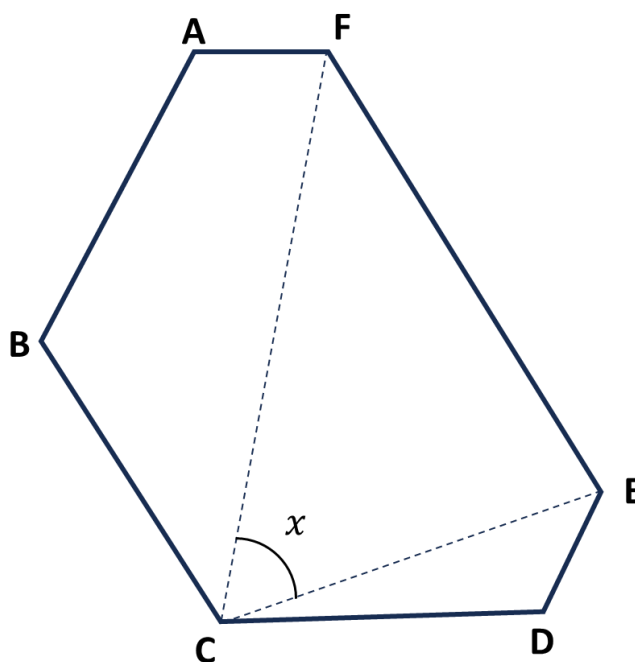
[Question 9]

The hexagon ABCDEF as shown below, satisfies

$$\text{Angle A} = \text{Angle B} = \text{Angle C} = \text{Angle E} = \text{Angle F} = 120 \text{ degree}$$

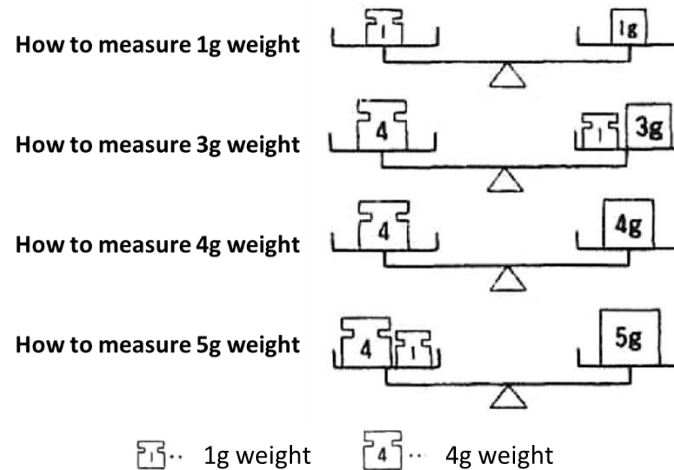
$$AB = BC = CD \text{ and } AF = DE$$

If the area of triangle FCE is 60 cm^2 and the angle x in the figure is 60 degrees, then find the area of hexagon ABCDEF in cm^2 .



[Question 10]

Reiko has 1-gram and 4-gram weight each. By using the weight balance and 1-gram and 4-gram weights, she can measure 4 weight levels as shown in the figure. However, she cannot measure 2-gram weight level.



Reiko will buy two weights to measure as much weight as she can and **ALL** integer weight levels from 1-gram, 2-gram, 3-gram, ... to the maximum weight level. What the two weights should she buy?