

Year 5 and 6 (English Version)

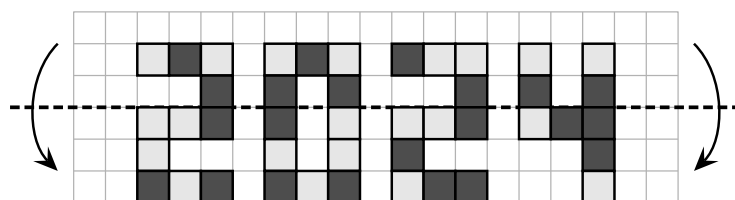
Thursday, 21st March 2024

Time allowed: 60 minutes

1. For each question exactly one of the 5 options is correct.
2. Each participant is given 24 points at the beginning. For each correct answer 3, 4 or 5 points are added. No answer means 0 points are added. If a wrong answer is given, one quarter of the points is subtracted, i. e. 0.75 points, 1 point or 1.25 points, respectively. At the end, the maximum number of points is 120, the minimum is 0.
3. Calculators and other electronic devices are not allowed.

3 point problems

- 1.** Kira draws the number 2024 on squared paper. She colours some of the squares black. Then she folds her paper along the dotted line:



In how many places is one black square directly on top of another black square?

- (A) 3 (B) 5 (C) 7 (D) 8 (E) 10

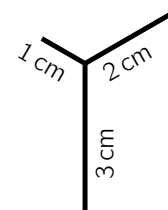
- 2.** Bastian hops on the square tiles in the schoolyard according to the pattern drawn on the right. On which of the following tiles will Bastian land with his right foot only?

- (A) on the 14th (B) on the 15th (C) on the 16th
 (D) on the 17th (E) on the 18th



- 3.** Pia wants to trace the figure on the right with her red pencil in one go without lifting it. She can start at any point. Pia wants to draw as little as possible twice. How long is the path that Pia's red pencil has to cover?

- (A) 7 cm (B) 8 cm (C) 9 cm (D) 10 cm (E) 11 cm



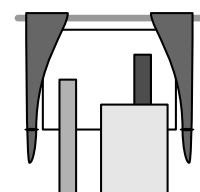
- 4.** We have a secret alphabet in our class. There is a special symbol for each letter. This is how my friends Linus and Eva write their names: **⊙VΛN*** and **⊖Z≡**.

And I'm Luisa. How is my name written?

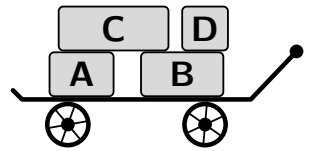
- (A) **⊙ZΛV≡** (B) **≡⊙VΛ⊖** (C) **⊙Λ≡VZ** (D) **⊖≡VΛZ** (E) **⊙ΛV***

- 5.** Fritz is building a bookcase with his father. He has leaned three boards against the window. What does it look like from outside?

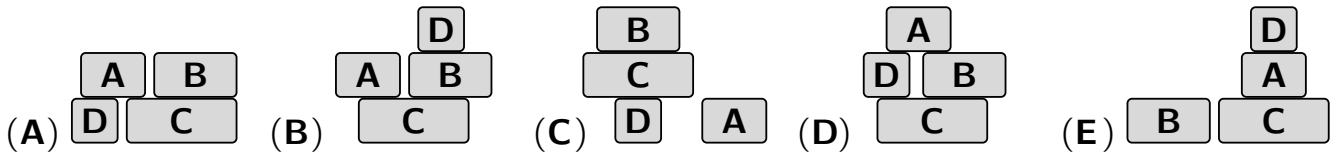
- (A) (B) (C) (D) (E)



6. Veronika pulls 4 heavy parcels home with her handcart. There she unloads the parcels one by one.

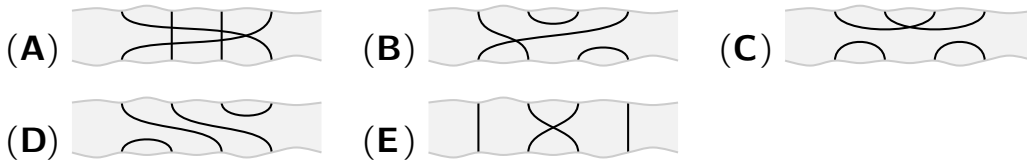
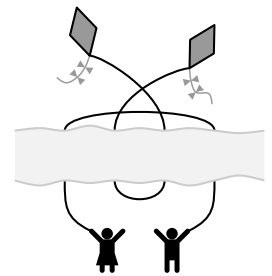


Which of the following piles cannot be created?



7. Natalie's kite and Samir's kite are already high up in the sky. A band of clouds suddenly blocks the view of the two strings.

How could the strings run through the band of clouds?



8. The rooms at the mountain hotel "Relax" are numbered consecutively. The first room is room number 1. Runa and Oskar run through all the corridors and count the twos and the fives in all the room numbers. Runa has counted 14 twos and Oskar has counted 3 fives.

How many rooms can the hotel have at most?

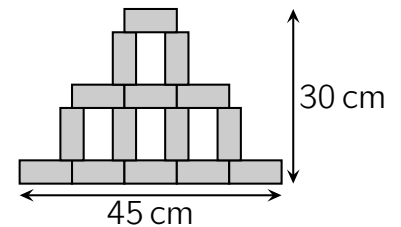
- (A) 25 (B) 26 (C) 34 (D) 35 (E) 41

4 point problems

9. Hakan has lots of identical rectangular pieces of paper. He creates the figure on the right. The figure is 45 cm wide and 30 cm high.

What are the side lengths of one single rectangle?

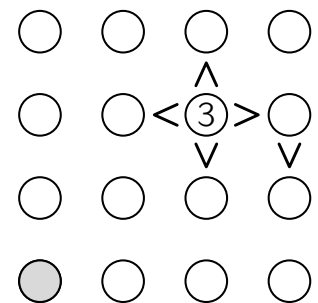
- (A) 9 cm and 5 cm (B) 8 cm and 4 cm (C) 9 cm and 3 cm
(D) 8 cm and 5 cm (E) 9 cm and 4 cm



10. The numbers 1, 2, 3 and 4 should be written in the circles of the figure. Each of the four numbers should appear exactly once in each row and in each column. The sign > should always point from the larger number with the tip to the smaller number.

Which number should be written in the grey circle?

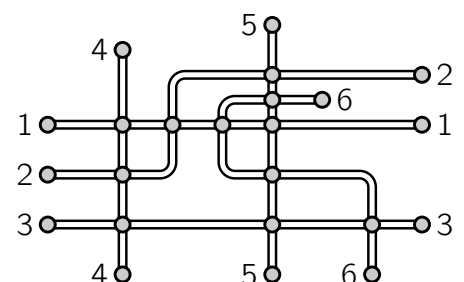
- (A) 1 (B) 2 (C) 3 (D) 4
(E) There are multiple possibilities.



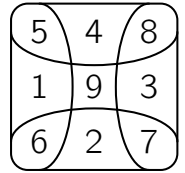
11. The picture shows the bus network of Middlecity. The bus lines must be coloured so that bus lines that share a common station are painted with different colours.

How many colours are needed for this?

- (A) 2 (B) 3 (C) 4 (D) 5 (E) 6



12. Eduardo throws three pebbles onto the fields drawn on the right. He hits three different squares. The sum of the three scores is 11. What is the maximum difference between his highest and lowest score?



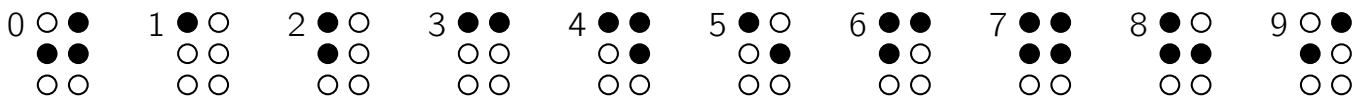
- (A) 8 (B) 7 (C) 6 (D) 5 (E) 4

13. There are three identical dice on the table. What is the sum of the three numbers on the faces of the dice touching the table?



- (A) 37 (B) 43 (C) 48 (D) 51 (E) 54

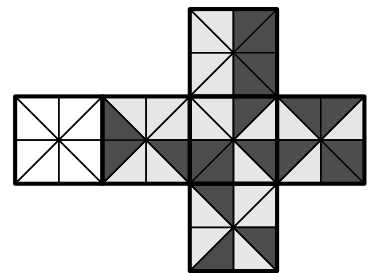
14. Louis Braille developed a font for blind and severely visually impaired people in 1825. Letters and numbers can be felt with the fingers. The following characters are used for the 10 digits:



How many 2-digit numbers can be represented with exactly 4 black dots?

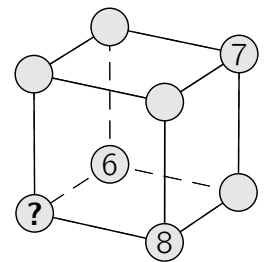
- (A) 18 (B) 21 (C) 23 (D) 26 (E) 27

15. Mia wants to fold a cube from the cube net shown. Two triangles meeting at one edge of the cube should have the same colour. How should Mia colour the left, still white square?



- (A) (B) (C) (D) (E)

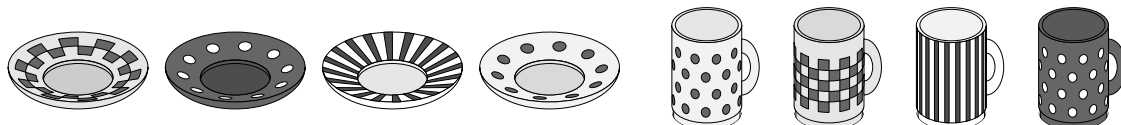
16. The numbers 6, 7 and 8 are written on three vertices of the cube. The numbers from 1 to 5 should be written on the other vertices so that the sums of the 4 vertex numbers of each face of the cube are equal. Which number does the question mark represent?



- (A) 1 (B) 2 (C) 3 (D) 4 (E) 5

5 point problems

17. Shirley sets the table. As usual, she places the 4 cups on the 4 saucers at random without paying attention to the matching patterns. Which statement is then surely correct?



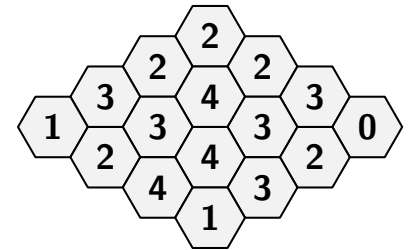
- (A) It is certain that none of the 4 cups is placed on its matching saucer.
 (B) It is certain that there is exactly 1 cup placed on its matching saucer.
 (C) It is not possible for exactly 2 cups to be placed on their matching saucers.
 (D) It is not possible for exactly 3 cups to be placed on their matching saucers.
 (E) It is not possible for all 4 cups to be placed on their matching saucers.

- 18.** The thread-eating moths Fa, Mo and Tzz find a thread. Fa wants to divide the thread into 6 pieces of equal length and marks the division points. Mo wants to divide it into 9 pieces of equal length and also marks the division points. Tzz bites the thread at all the marked points. How many pieces are there at the end?

(A) 9 (B) 10 (C) 11 (D) 12 (E) 13

- 19.** Some cells in the beehive contain honey. The number in each cell indicates how many of its neighbouring cells contain honey. How many cells in this beehive contain honey?

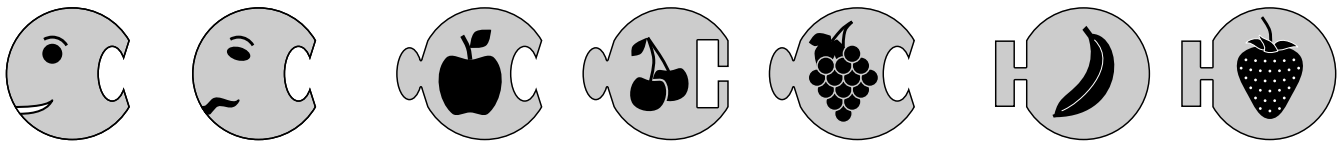
(A) 7 (B) 8 (C) 9 (D) 10 (E) 11



- 20.** All grandchildren are on vacation at their grandparents'. Grandmother is amazed at all the laundry. Will the clothes pegs be enough? She would always like to hang up one pair of socks with one peg each. But that would leave 7 pairs of socks. So she always hangs up 3 socks with one peg. And that works out exactly. How many socks has she washed?

(A) 42 (B) 36 (C) 32 (D) 30 (E) 26

- 21.** Richard wants to create a caterpillar with a head and a tail from a total of 3 or 4 or 5 pieces.



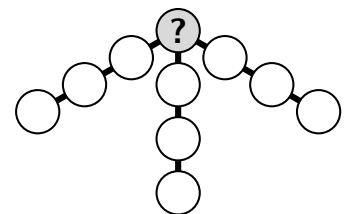
How many different caterpillars can Richard build according to these rules?

(A) 12 (B) 14 (C) 16 (D) 18 (E) 20

- 22.** Maira wants to write the numbers from 1 to 10 in the 10 circles so that the sum of the 4 numbers in each of the 3 "arms" of the figure is 23.

What number must she write in the circle with the question mark?

(A) 8 (B) 7 (C) 6 (D) 5 (E) 4



- 23.** Hannes sometimes helps his parents in the restaurant. Today he gets a box full of napkins and has to distribute them among the napkin holders. He puts 20 napkins in each napkin holder. Now there are 12 napkins left in the box. These 12 napkins are not enough to add another napkin to each holder. How many napkins could have been in the box at the beginning?

(A) 198 (B) 232 (C) 288 (D) 362 (E) 432

- 24.** Kristina writes a 3-digit number in her diary. That is how many kilometers she cycled on vacation. Her older brother attaches a digit on the right. This is now the number of kilometers he has cycled. He has cycled 2024 kilometers more than Kristina. What digit did he attach?

(A) 2 (B) 3 (C) 5 (D) 8 (E) 9