Year 5 and 6 (ENGLISH VERSION)

Thursday, 21st March 2019   Time allowed: 75 minutes
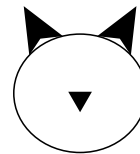
1. For each question exactly one of the 5 options is correct.
2. Each participant is given 24 points at the beginning. For each correct answer 3, 4 or 5 points are added. No answer means 0 points are added. If a wrong answer is given, one quarter of the points is subtracted, i. e. 0.75 points, 1 point 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

A1 Which of the following calculations gives the smallest result?

(**A**) $2 \times 0 + 1 \times 9$ (**B**) $2 \times (0 + 1) \times 9$ (**C**) $2 + 0 + 1 + 9$

(**D**) $(2 + 0 + 1) \times 9$ (**E**) $2 \times (0 + 1 + 9)$

A2 Johanna has started to draw a cat with a black felt-tip pen: Which of the following cat faces could be the final picture?

A3 The Mayan people wrote numbers with dots and bars. In the Mayan numbers from 1 to 19, a dot stands for 1, and a bar stands for 5. On the right, the Mayan number 8 is shown. What does the Mayan number 17 look like?
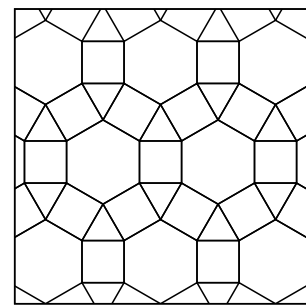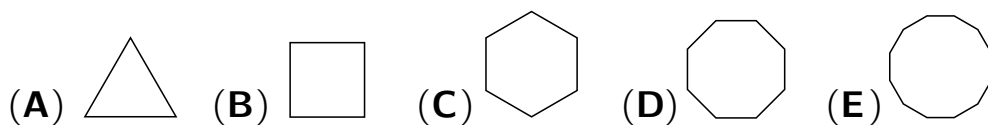

A4 On the 6 sides of a standard die there are 1, 2, 3, 4, 5 and 6 dots. The numbers of dots on each pair of opposite sides add up to 7. Only one of the following pictures shows a standard die. Which one?

A5 Which of the following five regular geometric figures (triangle, square, hexagon, octagon, dodecagon) *cannot* be found in the pattern on the right?

(**A**) △   (**B**) □   (**C**) ⬡   (**D**) ⯃   (**E**) ⬡

A6 Jannik has written the 6 smallest *odd* natural numbers on the 6 sides of a die. He rolls the die 3 times and adds the 3 numbers rolled. Which result is *not* possible?

(**A**) 21   (**B**) 3   (**C**) 20   (**D**) 19   (**E**) 27

A7 Ada made 5 different buildings, each one consisting of 8 cubes of the same size. She paints the entire surface of each building. For which building does she need the most paint?
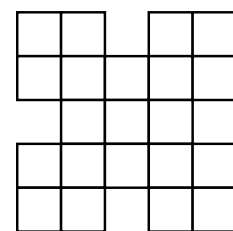
(**A**)   (**B**)   (**C**)   (**D**)   (**E**)
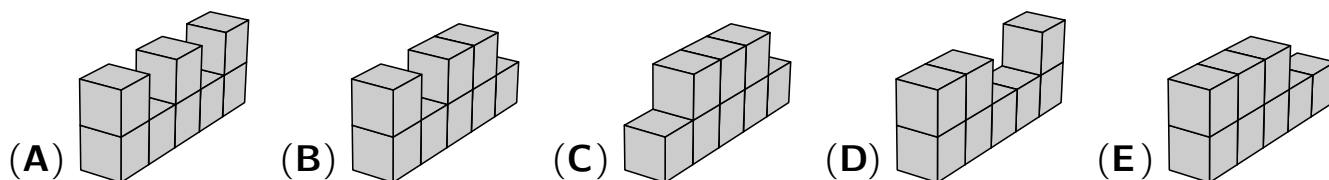
A8 The sum of the ages of all the children who live in the house next door is 56. In 2 years, the sum of the ages of these children will be 78. How many children live next door?

(**A**) 11   (**B**) 13   (**C**) 14   (**D**) 16   (**E**) 17

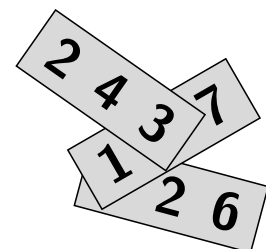### 4 point problems

B1 Karlotta wants to paint a 2×2 square in the figure red. How many possibilities does she have to do this?

(**A**) 5   (**B**) 6   (**C**) 7   (**D**) 8   (**E**) 9

B2 There is a three-digit number on each of the three strips of paper shown on the right. The sum of these three numbers is 826. What is the sum of the two hidden digits?
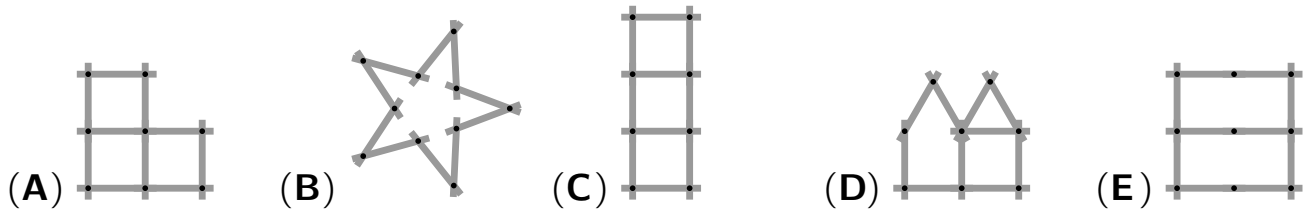
(**A**) 5   (**B**) 6   (**C**) 7   (**D**) 8   (**E**) 9
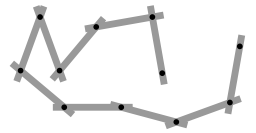
B3 Tilla, the frog, normally eats 5 spiders a day. If she is extremely hungry, she eats 10 spiders a day. In the past 9 days, Tilla ate 60 spiders in total. How many days was Tilla extremely hungry?

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

B4 Pia plays with a yardstick that consists of 10 sticks of the same length: Which of the following figures *cannot* be formed with Pia's yardstick?

(**A**)   (**B**)   (**C**)   (**D**)   (**E**)

B5 A square is divided into smaller squares of the same size in five different ways. In which figure is the black part of the area the largest?

(**A**)   (**B**)   (**C**)   (**D**)   (**E**)
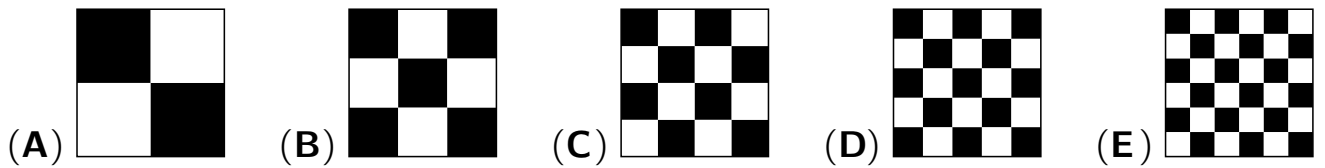
B6 A large equilateral triangle is divided into smaller equilateral triangles, as shown on the right. The side length of the small grey triangle is 1 cm. Melanie draws a thick line on the perimeter of the large triangle. How long is the perimeter of the large triangle?
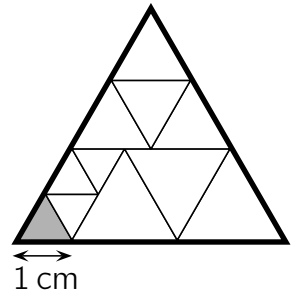
(**A**) 15 cm   (**B**) 17 cm   (**C**) 18 cm   (**D**) 20 cm   (**E**) 21 cm

1 cm

B7 During the school trip, our class teacher talks about her children. Four of her five statements are correct, but one statement is wrong. Which one?

(**A**) "My daughter Anna has 2 brothers."   (**B**) "My son Ole has 3 sisters."
(**C**) "I have 5 children."   (**D**) "My son Ole has 2 brothers."
(**E**) "My daughter Anna has 2 sisters."

B8 Ceylin built the towers shown one after another from bricks that are 2 cm long, 1 cm wide and 1 cm high. Following the same pattern, she now builds a tower from 28 such bricks. How high is this tower?
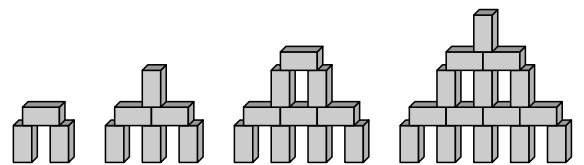
(**A**) 9 cm   (**B**) 11 cm   (**C**) 12 cm   (**D**) 14 cm   (**E**) 17 cm

⟨ **5 point problems** ⟩

C1 Constantin folds a square piece of paper twice. Then, he cuts it twice, as shown in the diagram. How many pieces of paper will he have in the end?
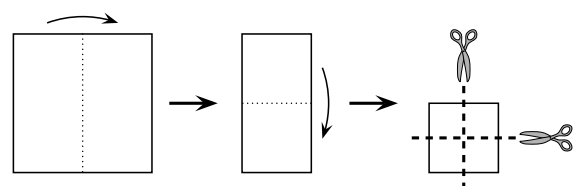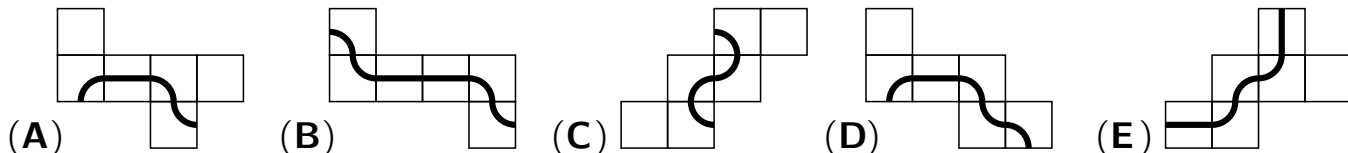
(**A**) 9   (**B**) 10   (**C**) 12   (**D**) 15   (**E**) 16

C2 Josef and Mila are throwing balls at two identical pyramids of 15 cans. Josef knocks down 6 cans with a total of 25 points. Mila knocks down 4 cans. How many points does Mila have?

(**A**) 22   (**B**) 23   (**C**) 25   (**D**) 26   (**E**) 28   after Josef's throw   after Mila's throw
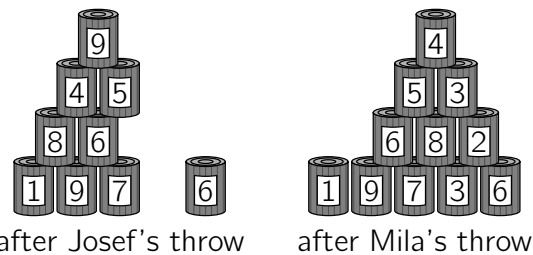
C3 Only one of the following nets can be folded to give a cube that has a closed curve on it. Which one?

(**A**)   (**B**)   (**C**)   (**D**)   (**E**)

C4 Kaspar has balls, dice and coins, a total of 30 objects. For a magic trick he puts a cloth over them. When he lifts the cloth, 6 dice are turned into 6 balls. He does this again. This time 5 balls are turned into 5 coins. Now, there is the same number of dice, balls and coins. How many balls were there at the beginning?

(**A**) 4   (**B**) 5   (**C**) 9   (**D**) 10   (**E**) 11

C5 Adriano writes a natural number in the first of the 6 circles. Then, he fills the other circles one after another following the instructions. How many of the 6 numbers are divisible by 3?

$$\bigcirc \xrightarrow{+1} \bigcirc \xrightarrow{+1} \bigcirc \xrightarrow{\times 3} \bigcirc \xrightarrow{+2} \bigcirc \xrightarrow{\times 2} \bigcirc$$
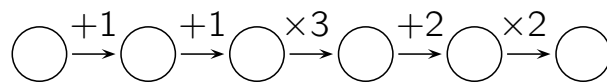
(**A**) only one   (**B**) one or two   (**C**) exactly two
(**D**) two or three   (**E**) three or four

C6 Julie took selfies with her 8 cousins. Each of the 8 cousins is in 2 or 3 of the selfies. In each selfie there are exactly 5 cousins. How many selfies did Julie take?

(**A**) 3   (**B**) 4   (**C**) 5   (**D**) 6   (**E**) 7

C7 Carlos builds a large $4 \times 4 \times 4$ cube from 32 white and 32 black small $1 \times 1 \times 1$ cubes such that the white part of the surface of the large cube is as large as possible. How many faces of the small white cubes belong to the surface of the large cube?

(**A**) 56   (**B**) 62   (**C**) 64   (**D**) 72   (**E**) 76

C8 The parcels with the prizes for the Kangaroo competition are stacked on pallets. In the evening, there are 11 pallets with a total of 370 parcels standing in a row. On the individual pallets there are different numbers of parcels, but on 3 consecutive pallets there are always exactly 99 parcels in total. How many parcels are on the 6th pallet?

(**A**) 26   (**B**) 30   (**C**) 33   (**D**) 35   (**E**) 36