

## Year 5 and 6 (ENGLISH VERSION)

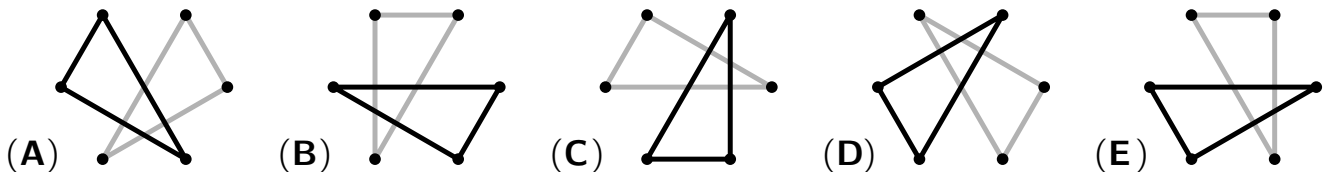
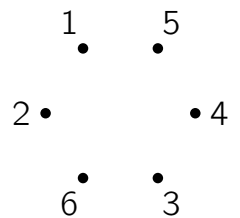
Thursday, 17th March 2022

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.

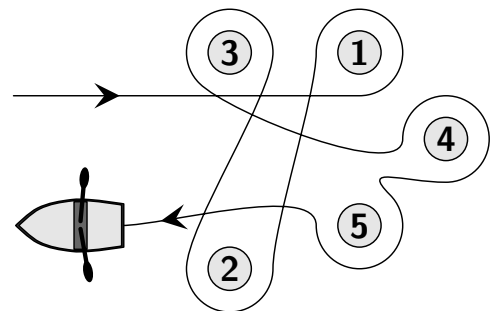
### 3 point problems

**A1** In the picture on the right, Kim connects all the points with odd numbers. Franzl connects all the points with even numbers. This way two triangles are drawn. Which picture shows these two triangles?



**A2** Eileen rowed around five buoys. Which buoys did she row around in an anticlockwise direction?

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



**A3** Which of the five calculations has the largest result?

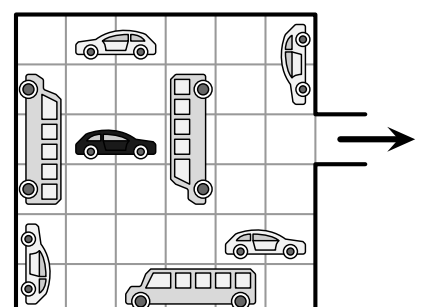
- (A)  $20 + 22$       (B)  $202 + 2$       (C)  $202 \div 2$       (D)  $20 \times 22$       (E)  $202 \times 2$

**A4** Georg's great-grandfather turns 95. Georg wants to buy exactly 95 balloons for the birthday party. They come in packages of 5, 10 and 25. What is the minimum number of packages that Georg has to buy?

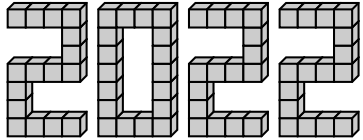
- (A) 3      (B) 5      (C) 7      (D) 8      (E) 10

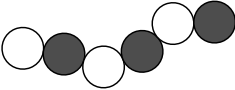
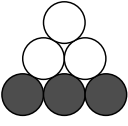
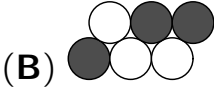
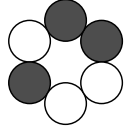
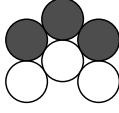
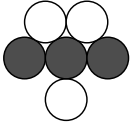
**A5** The vehicles in the car park are only allowed to drive straight ahead. How many of the grey vehicles must move so that the black car can leave the car park afterwards?

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

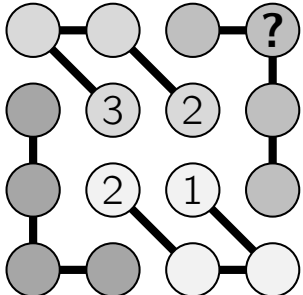


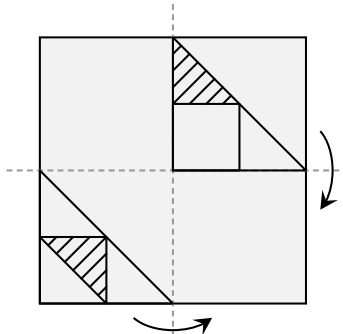
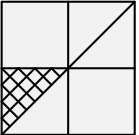
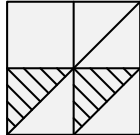
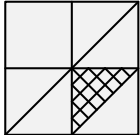
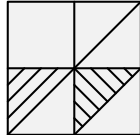
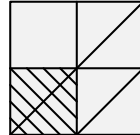
- A6** There are 7 cards on the table: 4 69 113 8 51 5 67 Bruno uses them to make the smallest possible 12-digit number. What are the last three digits of this number?
- (A) 698      (B) 113      (C) 551      (D) 869      (E) 458

- A7** Masoud built the number 2022 with 66 cubes, as shown in the picture. To do this, he always applies glue to both faces that he glues together. Some cubes have two sides covered with glue, some only one. How many cubes have two sides covered with glue?
- 
- (A) 16      (B) 30      (C) 46      (D) 54      (E) 60

- A8** A caterpillar curled up to sleep. What could this look like?
- 
- (A)  (B)  (C)  (D)  (E) 

4 point problems

- B1** Lennart wants to complete the figure on the right. In each group of four connected circles and also in each column and in each row, the numbers 1, 2, 3 and 4 each have to appear exactly once. What number must he write in the circle containing the question mark?
- 
- (A) 1    (B) 2    (C) 3    (D) 4    (E) This is not possible.

- B2** Two figures are drawn on a transparent piece of paper, which is folded twice, as shown. What does the folded paper look like now?
- 
- (A)  (B)  (C)  (D)  (E) 

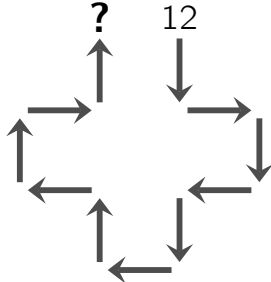
- B3** Juri breaks a long thin stick into 3 parts. Then he breaks repeatedly the longest piece into 3 parts. What number of sticks can he not get this way?
- (A) 13      (B) 17      (C) 20      (D) 23      (E) 25

- B4** Clara came across the instructions shown. The arrows indicate how to calculate. Clara tries out the instructions. She starts with 12, because it is her birthday on 12 April. What number does she get as a result?
- instructions

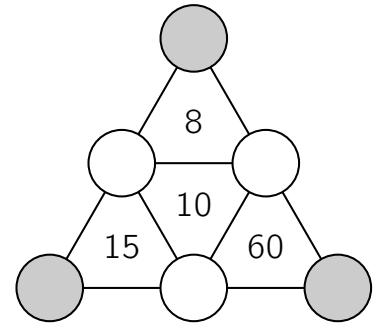
$\times 2$      $\div 2$

$\rightarrow$      $\leftarrow$

$\times 4$      $\div 4$

$\downarrow$      $\uparrow$
- 
- (A) 3    (B) 6    (C) 16    (D) 24    (E) 48

**B5** Ron wants to write the numbers 1, 2, 3, 4, 5, 6 into the six circles so that in each of the four small triangles, the number in the middle is equal to the product of the numbers in the three corners. What will be the sum of the numbers in the three grey circles?

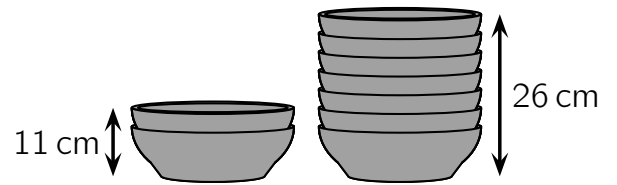


- (A) 8      (B) 11      (C) 12      (D) 13      (E) 16

**B6** The year 2022 has the special property that one digit appears 3 times in it. Our 50-year-old turtle Rosi has already experienced several years in which one digit appears 3 times. How often did she experience this before 2022?

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

**B7** Some bowls are stacked on top of each other. The stack of 2 bowls is 11 cm high, and the stack of 7 bowls is 26 cm high. How high is a stack of 5 such bowls?



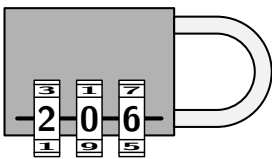
- (A) 17 cm      (B) 19 cm      (C) 20 cm      (D) 21 cm      (E) 22 cm

**B8** Mrs Wolf often walks the four dogs of her neighbours. The other day the dogs were weighed and now it is clear: the weight of each dog in kg is a whole number. No two of them weigh the same. All four together weigh 30 kg. Ajax is the second heaviest and weighs 13 kg. How much does Elvis, the third heaviest, weigh?

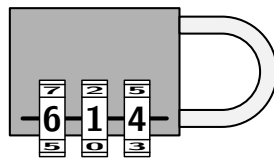
- (A) 2 kg      (B) 3 kg      (C) 5 kg      (D) 7 kg      (E) 8 kg

**5 point problems**

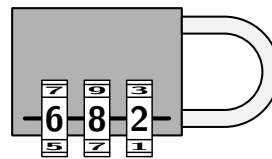
**C1** To open the lock, Janosch gets four helpful hints:



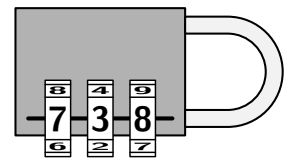
Exactly two of these digits are correct, but both are in the wrong place.



Exactly one of these digits is correct, but it is in the wrong place.



Exactly one of these digits is correct, and it is in the right place.



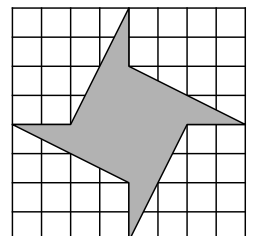
All three digits are incorrect.

What is the correct code that Janosch can use to open the lock?

- (A) 604      (B) 082      (C) 640      (D) 042      (E) 046

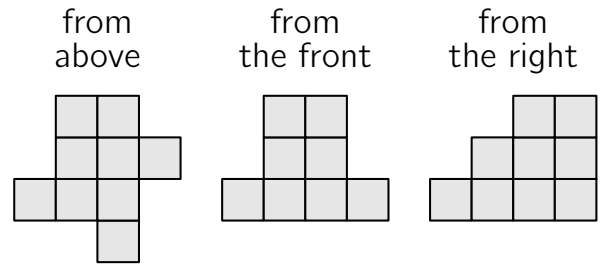
**C2** A square is composed of 64 equally sized square boxes. Part of the square is painted grey. What is the area of the grey part?

- (A) 14 boxes      (B) 16 boxes      (C) 18 boxes  
(D) 20 boxes      (E) 22 boxes



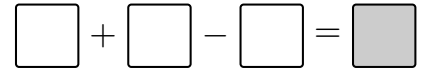
**C3** The diagram shows a structure made of cubes of the same size from above, from the front and from the right. What largest number of cubes can this structure consist of?

- (A) 18 (B) 19 (C) 20 (D) 21 (E) 22



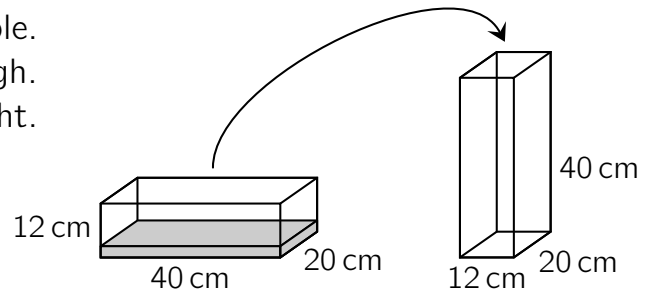
**C4** Hanna wants to choose four of the numbers 3, 4, 5, 6 and 7 so that she can write them in the four boxes and get a correct calculation. She thinks about how many of the five numbers can be in the grey box as the result of the calculation. How many of the five numbers could Hanna write in the grey box?

- (A) only one (B) only two (C) only three (D) only four (E) all five

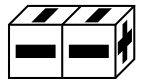


**C5** There are two cuboid-shaped vessels on the table. In the low one on the left there is water 3 cm high. The water is poured into the high vessel on the right. What will the water level be in this vessel?

- (A) 10 cm (B) 15 cm  
(C) 18 cm (D) 20 cm (E) 24 cm



**C6** Which of the following nets can certainly not be folded to make the solid shown on the right?



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

**C7** There are points  $A$ ,  $B$ ,  $C$  and  $D$  on a straight line. The distance between  $A$  and  $B$  is 7 cm, the distance between  $B$  and  $C$  is 5 cm, the points  $C$  and  $D$  are 8 cm apart, and  $D$  and  $A$  are 6 cm apart. Which of the four points  $A$ ,  $B$ ,  $C$  and  $D$  are furthest apart from each other?

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

**C8** Thirty fantastic creatures, Yes-creatures and Fuzzy-creatures, sit around a round table. The Yes-creatures always speak the truth. The Fuzzy-creatures sometimes speak the truth, sometimes they lie, just as it suits them. Each creature is asked about the creatures next to it, and each creature says: "At least one of my two neighbouring creatures is a Fuzzy-creature." What is the largest possible number of Yes-creatures that could sit at the table?

- (A) 5 (B) 10 (C) 15 (D) 20 (E) 25