KÄNGURU DER MATHEMATIK 2022
17. 3. 2022

Level: Benjamin, Grades 5 - 6

Name:	
School:	
Class:	

Time: 60 min.
24 starting points

each correct answer to questions 1. – 8.:	3 points
each correct answer to questions 9. – 16.:	4 points
each correct answer to questions 17. – 24.:	5 points
each questions left unanswered:	0 points
each incorrect answer:	minus ¼ of the points for the question

Please write the letter (A, B, C, D, E) of the correct answer in the square under the question number (1 bis 24). Write clearly and carefully!

1	2	3	4	5	6	7	8

9	10	11	12	13	14	15	16

17	18	19	20	21	22	23	24

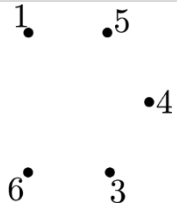
pwc

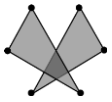
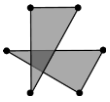
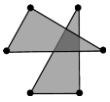
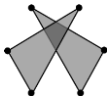
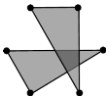
Information über den Känguruwettbewerb: www.kaenguru.at
Wenn du mehr in dieser Richtung machen möchtest,
gibt es die Österreichische Mathematikolympiade;
Infos unter: www.oemo.at

Känguru der Mathematik 2022
Level Benjamin (Schulstufe 5 and 6)
Austria – 17. 3. 2022

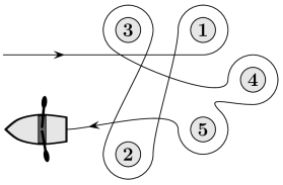
- 3 Point Examples -

1. Six points are placed and numbered as shown on the right.
Two triangles are drawn: one by connecting the even numbered points, and one by connecting the odd numbered points.
Which of the following shapes is the result?



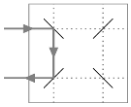
(A)  (B)  (C)  (D)  (E) 

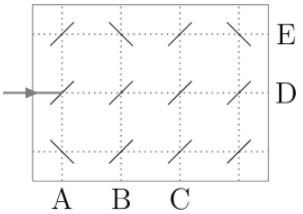
2. Eva paddles around five buoys with her boat (see diagram).
Which of the buoys does she paddle around in an anti-clockwise direction?



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

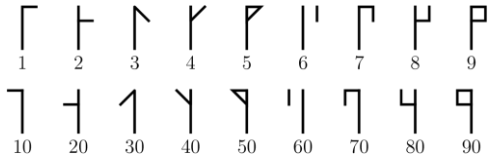
3. The two-sided mirrors reflect the laser beams as shown in the small picture on the left.
At which letter does the laser beam leave the picture on the right?





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

4. In the 13th century, monks used to write numbers in the following way:
For the numbers 1 to 99 they used the signs shown here or a combination of two of these signs.
E.g. the number 24 was written like  , the number 81 like  and the number 93 like  . What did the number 45 look like?

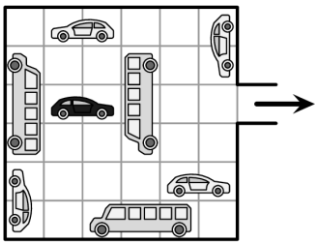


(A) (B) (C)  (D)  (E) 

5. Marbles are sold in packages of 5, 10 or 25. Tom buys exactly 95 marbles.
What is the minimum number of packages Tom has to buy?

(A) 4 (B) 5 (C) 7 (D) 8 (E) 10

6. All vehicles in the garage can only drive forwards or backwards.
The black car wants to leave the garage (see diagram). What is the minimum number of grey vehicles that need to move at least a little bit so that this is possible?



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

7. Bodil lays these seven cards $\boxed{4}$ $\boxed{69}$ $\boxed{113}$ $\boxed{9}$ $\boxed{51}$ $\boxed{5}$ $\boxed{67}$ next to each other, so that the smallest possible 12-digit number which can be made from these cards is formed.
What are the last three digits of this number?

(A) 699 (B) 113 (C) 551 (D) 967 (E) 459

8. How much does this Ferris wheel need to turn so that a white gondola is on top for the first time?

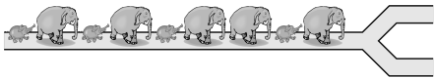
(A) $\frac{1}{2}$ turn (B) $\frac{1}{3}$ turn (C) $\frac{1}{6}$ turn (D) $\frac{1}{12}$ turn (E) $\frac{5}{6}$ turn

- 4 Point Examples -

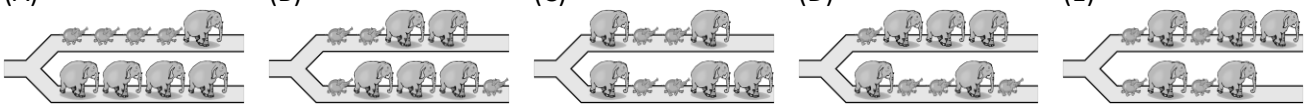
9. The sides of the square *ABCD* are 10 cm long.
What is the total area of the shaded part?

(A) 40 cm² (B) 45 cm² (C) 50 cm² (D) 55 cm² (E) 60 cm²

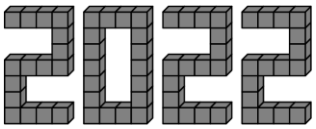
10. Five big and four small elephants are marching along a path.
Since the path is narrow the elephants cannot change their order.
At the fork in the path each elephant either goes to the right or to the left.
Which of the following situations cannot happen?



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

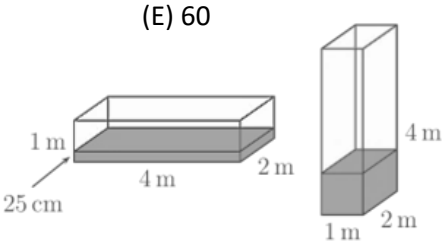


11. Marc builds the number 2022 as seen in the picture by glueing together 66 cubes of the same size. Afterwards he paints the entire surface of his work.
On how many of the 66 cubes has Marc painted exactly four faces?



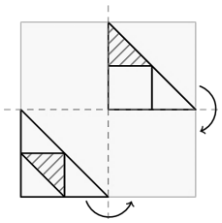
(A) 16 (B) 30 (C) 46 (D) 54 (E) 60

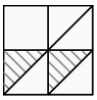
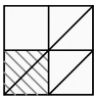
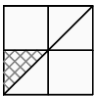
12. In a box-shaped water tank with dimensions 4 m x 2 m x 1 m, the height of the water is 25 cm.
The tank is then turned on its side (see picture on the right).
How high is the water in the tank now?



(A) 25 cm (B) 50 cm (C) 75 cm (D) 1 m (E) 1.25 m

13. Some art work can be seen on a square-shaped transparent piece of foil.
The foil is folded over twice as shown in the diagram.
What does the foil look like after it has been folded over twice?

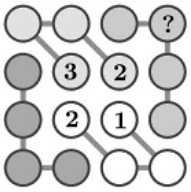


(A)  (B)  (C)  (D)  (E) 

14. The year 2022 has three equal digits.
This is the third time that Tortoise Eva has experienced a year where the same digit appears three times.
What is the minimum age that tortoise Eva can be this year?

(A) 20 (B) 22 (C) 23 (D) 56 (E) 134

15. Four circles are always connected by a line to form chains of four in a drawing.
The numbers 1, 2, 3 and 4 appear in each row, each column and each chain of four.



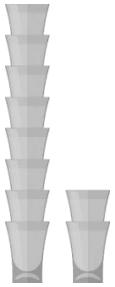
Which number is in the circle with the question mark?

(A) 1 (B) 2 (C) 3 (D) 4 (E) This cannot be determined.

16. Lisa has four differently heavy dogs. Each dog weighs a whole number of kilograms.
All dogs together weigh 60 kg. The second heaviest dog weighs 28 kg.
How heavy is the third heaviest dog?

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

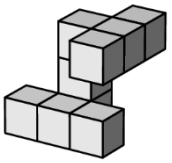
- 5 Point Examples -

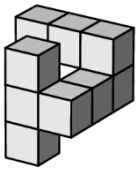
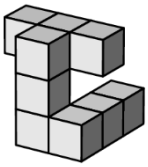
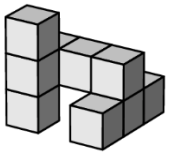
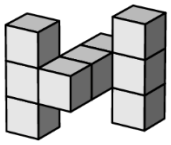
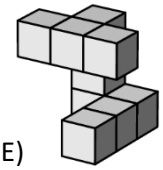


17. Some identical glasses are stacked on top of each other.
A stack with eight glasses is 42 cm high. A stack with two glasses is 18 cm high.
How high is a stack with six glasses?
(A) 22 cm (B) 24 cm (C) 28 cm (D) 34 cm (E) 40 cm

18. The bus stops in the villages A, B, C and D are situated along a road in this order.
The distance between two bus stops in neighbouring villages is 10 km.
10 children live in village A, 20 in village B, 30 in village C and 40 in village D. All children take the bus to go to school. A new school is going to be built. In order to find a suitable place, the kilometers that each child would travel by bus are added together. The school is then built at the place where this sum is smallest.
Where will the new school be built?
(A) in A (B) in B (C) in the middle between B and C (D) in C (E) in D

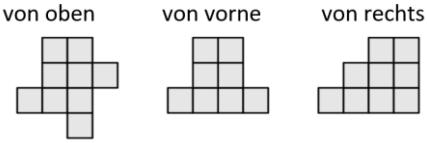
19. Anna has glued together several cubes of the same size to form a solid (see picture).
Which of the following pictures shows a different view of this solid?



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

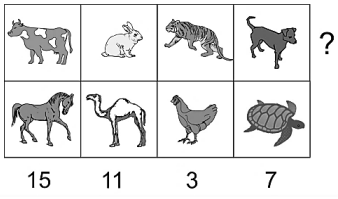
20. Werner inserts numbers in various ways into the empty squares $\square + \square - \square = \square$ in such a way that the calculation is correct. He always uses four of the numbers 2, 3, 4, 5 or 6 where in each calculation each number is only allowed to appear once.
How many of the five numbers can Werner insert into the grey square?
(A) 1 (B) 2 (C) 3 (D) 4 (E) 5

21. A building is made up of cubes of the same size.
The three pictures show it from above (von oben), from the front (von vorne) and from the right (von rechts).
What is the maximum number of cubes used to make this building?



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

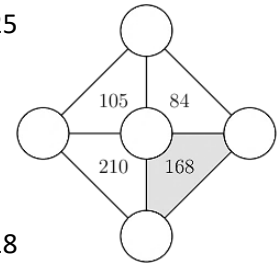
22. Each animal in the picture on the right represents a natural number greater than zero.
Different animals represent a different numbers.
The sum of the two numbers of each column is written underneath each column.
What is the maximum value the sum of the four numbers in the upper row can have?



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

23. 30 people are sitting around a round table. Some of them are wearing a hat.
Those who do not wear a hat, have to speak the truth.
Those who wear a hat can either speak the truth or lie.
They all claim: „At least one of my two neighbouring people wears a hat."
What is the biggest number of people that do not wear a hat?
(A) 5 (B) 10 (C) 15 (D) 20 (E) 25

24. Kai has to insert the numbers 3, 4, 5, 6 and 7 into the five circles of the diagram on the right in the following way: The product of the three numbers in the vertices of each triangle has to be equal to the number stated within the triangle.
How big is the sum of the numbers in the vertices of the triangle with the number 168?



(A) 12 (B) 14 (C) 15 (D) 17 (E) 18