

Känguru der Mathematik 2017 Level Benjamin (Grade 5 and 6) Österreich – 16. 3. 2017



- 3 Points Questions -

1. Four cards are placed in this order: 2 0 1 7
Which order cannot be obtained, if only two cards are swapped?

- (A) 2 7 1 0 (B) 0 1 2 7 (C) 1 0 2 7 (D) 0 2 1 7 (E) 2 0 7 1

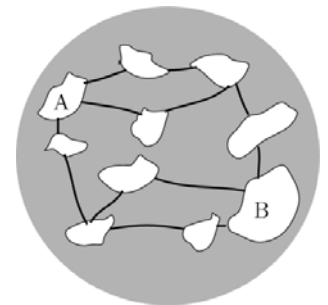
2. A fly has 6 legs, a spider 8.
Therefore 3 flies and 2 spiders together have the same amount of legs as 9 chickens and
(A) 2 cats (B) 3 cats (C) 4 cats (D) 5 cats (E) 6 cats

3. Anna has four identical building blocks that each look like this: .
Which shape can she not form with them?

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

4. Kevin knows that $1111 \times 1111 = 1234321$. Which result does he get for 1111×2222 ?
(A) 3456543 (B) 2345432 (C) 2234322 (D) 2468642 (E) 4321234

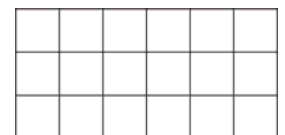
5. The 10 islands are connected by 12 bridges (see diagram). All bridges are open for traffic.
What is the minimum number of bridges that need to be closed off, so that the traffic between A and B comes to a halt?
(A) 1 (B) 2 (C) 3 (D) 4 (E) 5



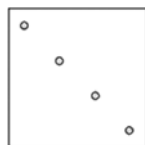
6. Jane, Kate and Lynn go for a walk. Jane walks at the very front, Kate in the middle and Lynn at the very back. Jane weighs 500 kg more than Kate and Kate weighs 1000 kg less than Lynn.
Which of the following pictures shows Jane, Kate and Lynn in the right order?

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

7. Max colours in the squares of the grid, so that one third of all squares are blue and one half of all squares are yellow. The rest he colours in red. How many squares does he have to colour in red?
(A) 1 (B) 2 (C) 3 (D) 4 (E) 5



8. Bob folds a piece of paper, then punches a hole into the paper and unfolds it again.



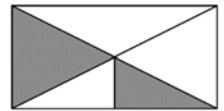
The unfolded paper then looks like this:
Along which dotted line has Bob folded the paper beforehand?

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

- 4 Points Questions -

9. A rectangle is twice as long as wide. Which fraction of the rectangle is coloured in grey?

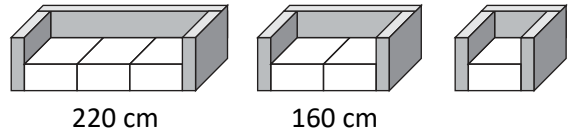
- (A) $\frac{1}{4}$ (B) $\frac{3}{8}$ (C) $\frac{3}{4}$ (D) $\frac{1}{2}$ (E) $\frac{3}{5}$



10. Only four players score goals in a handball game. Each one scored a different number of goals. Michael scored the fewest number of goals. If the other players altogether managed to score 20 goals in total, what is the maximum number of goals Michael could have scored?

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

11. A furniture shop sells 3-seater, 2-seater and 1-seater sofas that each have an equally wide armrest on the left and the right hand side. Each seat is equally wide (see picture). Together with the armrests the 3-seater sofa is 220 cm and the 2-seater sofa 160 cm wide.



How wide is the 1-seater sofa?

- (A) 60 cm (B) 80 cm (C) 90 cm (D) 100 cm (E) 120 cm

12. Tom strings together the numbers from 1 to 20 and obtains the 31-digit number 1234567891011121314151617181920.

Then he deletes 24 digits of the number, so that the remaining number is as big as possible. Which number does he obtain?

- (A) 9671819 (B) 9567892 (C) 9781920 (D) 9912345 (E) 9818192

13. There is a number written on every face of a special die. The sum of the numbers, which are on opposite sides to each other, is always equally big. Five of the six numbers are 5, 6, 9, 11 and 14. Which number is on the sixth face?

- (A) 4 (B) 7 (C) 8 (D) 13 (E) 15

14. Paul goes on a 5-day hiking trek. He starts on Monday and finishes on Friday. Every day he covers 2 km more than the day before. In total he hikes 70 km.

Which distance does he cover on Thursday?

- (A) 12 km (B) 13 km (C) 14 km (D) 15 km (E) 16 km

15. Boris wants to increase his pocket money. To achieve this a fairy gives him three magic wands. He has to use every single one exactly once.

Magic wand "+1" increases his money by 1 €



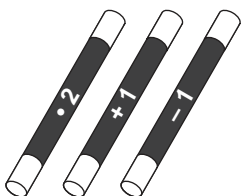
Magic wand "-1" decreases it by 1 €.



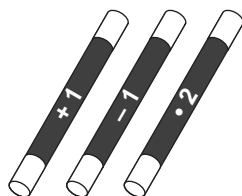
Magic wand "•2" doubles it.



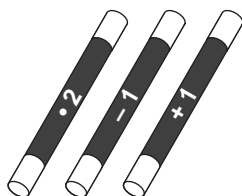
In which order does he have to use the magic wands, in order to get the most money?



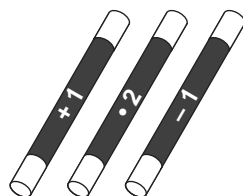
(A)



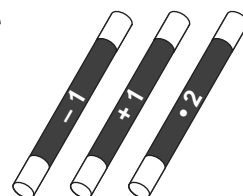
(B)



(C)



(D)

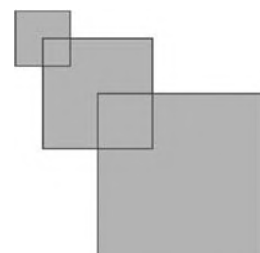


(E)


16. Raphael has three squares. The first one has side length 2 cm, the second one has side length 4 cm and one corner is the centre of the first square. The third square has side length 6 cm and one corner is the centre of the second square.

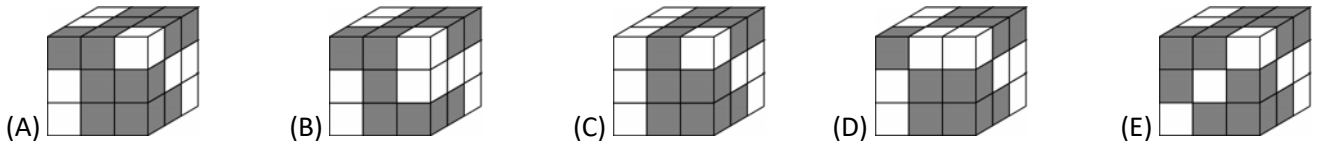
What is the total area of the figure shown?

- (A) 51 cm² (B) 32 cm² (C) 27 cm² (D) 16 cm² (E) 6 cm²

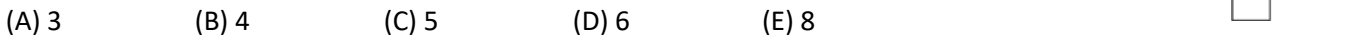


- 5 Points Questions -

17. A big cube is made up of 9 identical building blocks. Each building block looks like this:  Which big cube is possible?



18. The numbers 1, 2, 3, 4 and 5 have to be written into the five fields of this diagram according to the following rules: If one number is below another number, it has to be greater; if one number is to the right of another, it has to be greater. How many ways are there to place the numbers?



- (A) 3 (B) 4 (C) 5 (D) 6 (E) 8

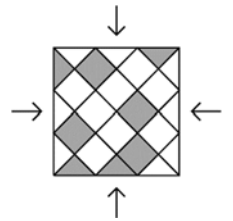
19. There are eight kangaroos in a row, as seen in the picture.



Two kangaroos, that are standing next to each other and that are looking into each others eyes, are changing places by hopping past each other. This is carried out until no more jumps are possible. How often did a change of places occur?

- (A) 2 (B) 10 (C) 12 (D) 13 (E) 16

20. A square floor is made up of triangular and square tiles in grey and white. What is the smallest number of grey tiles that have to be swapped with white tiles, so that the floor looks the same from all four given viewing directions?

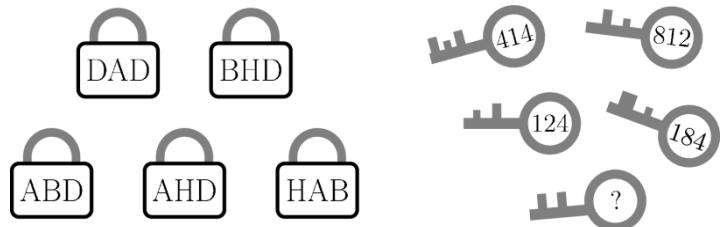


- (A) three triangles, one square (B) one triangle, three squares (C) one triangle, one square
 (D) three triangles, three squares (E) three triangles, two squares

21. In a bag there are only red and green marbles. If one randomly takes out five marbles, there is at least one red one. If one randomly takes out six marbles, there is at least one green one. What is the maximum number of marbles in the bag?

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

22. Each one of the 5 keys locks exactly one padlock. Every letter on a padlock stands for exactly one digit, same letters mean same digits. Which digits are on the key with the question mark?

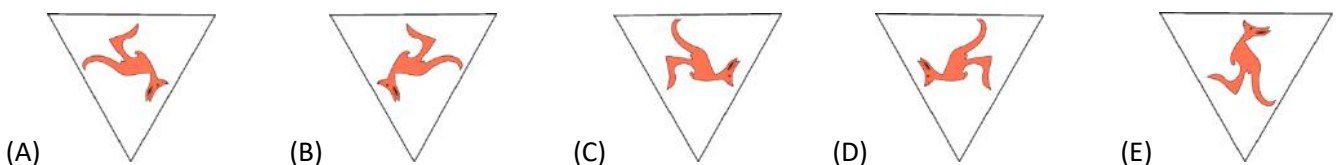
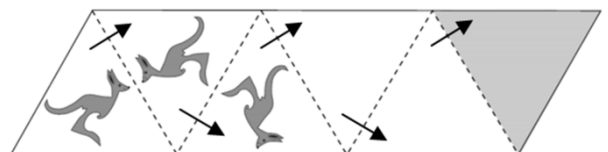


- (A) 382 (B) 282 (C) 284 (D) 823 (E) 824

23. Petra likes even numbers, Ina likes numbers that are divisible by three and Celina numbers that are divisible by 5. In a basket there are 8 balls, each with one number written on them. Each one of the three girls went to the basket on their own and took all balls according to their preferences. Petra took 32 and 52, Ina took 24, 33 and 45, and Celina took 20, 25 and 35. In which order did they go to the basket?

- (A) Petra, Celina, Ina (B) Celina, Ina, Petra (C) Ina, Petra, Celina (D) Ina, Celina, Petra (E) Celina, Petra, Ina

24. The first kangaroo is repeatedly mirrored along the dotted lines. Two reflections were already carried out. In which position is the kangaroo in the grey triangle?



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