23. Dan entered the numbers 1 to 9 in the cells of a 3×3 table. He began by placing the numbers 1, 2, 3 and 4 as shown in the picture. It happened that for the number 5, the sum of the numbers in the adjacent cells (having a common side) is equal to 9. What is the sum of the numbers adjacent to the number 6?

| 1		3
2		4

A) 14 **B)** 15 **C)** 17 **D)** 28 **E)** 29

24. Trees grow on only side of Park Avenue. There are 60 trees in total. Every second tree is a maple, and every third tree is either a linden or a maple. The remaining trees are birches. How many birches are there?

A) 10 **B)** 15 **C)** 20 **D)** 24 **E)** 30

25. Three equal rectangles are placed inside a square with side 24 cm, as shown in the diagram. What is the area of one rectangle?

A) 24 cm² **B)** 32 cm² **C)** 36 cm² **D)** 48 cm² **E)** 72 cm²
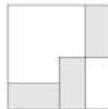
26. The king and his messengers are travelling from the castle to the summer palace at a speed of 5 km/h. Every hour, the king sends a messenger back to the castle, who travels at a speed of 10 km/h. What is the time interval between any two consecutive messengers arriving at the castle?

A) 30 min **B)** 60 min **C)** 75 min **D)** 90 min **E)** 120 min

27. There were 3 one-digit numbers on the blackboard. Ali added them up, and got 15. Then he erased one of the numbers and wrote the number 3 in its place. Then Reza multiplied the three numbers on the blackboard and got 36. What are the possibilities for the number that Ali erased?

A) Either 6 or 7 **B)** Either 7 or 8 **C)** Only 6 **D)** Only 7 **E)** Only 8

28. Rabbit Vasya loves cabbages and carrots. In a day, he eats either 9 carrots, or 2 cabbages, or 1 cabbage and 4 carrots. But some days he only eats grass. Over the last 10 days, Vasya ate a total of 30 carrots and 9 cabbages. On how many of these 10 days did he eat only grass?

A) 0 **B)** 1 **C)** 2 **D)** 3 **E)** 4

29. In Fabuland, every sunny day is immediately preceded by two consecutive rainy days. Also, the fifth day after any rainy day is again rainy. It is sunny today. For at most how many consequtive days can we predict the weather with certainty?

A) 1 day **B)** 2 days **C)** 4 days **D)** We cannot predict even one day ahead
E) We can predict the weather every day from here on

30. Granny has 10 grandchildren. Alice is the eldest. One day, Granny notices that her grandchildren all have different ages. If the sum of her grandchildrens' ages is 180, what is the youngest Alice could be?

A) 19 **B)** 20 **C)** 21 **D)** 22 **E)** 23

KANGAROO 2014

B

Time allowed: 75 minutes
Calculators are not permitted

Benjamin
5–6 grades

Questions for 3 points

1. 2014 is the current year. The sum of the digits of 2014 is equal to 7. After at least how many years the number of the year will have the sum of its digits equal to 7 again?

A) 18 **B)** 36 **C)** 90 **D)** 9 **E)** 990

2. A cake weights 900 g. Paul cuts it in 4 pieces. The biggest piece is as heavy as the 3 others weight altogether. What's the weight of the biggest piece?

A) 250 g **B)** 300 g **C)** 400 g **D)** 450 g **E)** 600 g

3. Two great rings, one grey, one white, are linked in each other. Peter, in front of the rings, sees the rings as in the picture. Paul is behind the rings. What does he see?

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

4. In the addition on the right, some of the digits have been replaced by stars. What is the sum of the missing digits?

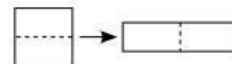$$\begin{array}{r} 1*2 \\ +1*3 \\ \underline{1*4} \\ 309 \end{array}$$

A) 0 **B)** 1 **C)** 2 **D)** 3 **E)** 10

5. What is the difference of the smallest 5-digit number and the largest 4-digit number?

A) 1 **B)** 10 **C)** 1111 **D)** 9000 **E)** 9900

6. A square of perimeter 48 is cut into 2 pieces to make a rectangle (see picture). What is the perimeter of the rectangle?

A) 24 **B)** 30 **C)** 48 **D)** 60 **E)** 72

7. Katrin has 38 matches. She builds a triangle and a square, using all the matches. Each side of the triangle consists of 6 matches. How many matches are in each side of the square?

A) 4 **B)** 5 **C)** 6 **D)** 7

8. The pearl necklace in the picture contains dark grey pearls and shiny white pearls. Arno wants to have 5 of the dark grey pearls. He can only take pearls from the ends of the necklace, and so he has to take some of the white pearls also. What is the smallest number of white pearls Arno has to take?

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

9. Harry participated in a broom flight contest which consisted of 5 laps. The times when Harry passed the starting point are shown in the picture. Which lap took the shortest time?
A) First   B) Second   C) Third   D) Fourth   E) Fifth

	Time
Start	09:55
After lap 1	10:26
After lap 2	10:54
After lap 3	11:28
After lap 4	12:03
After lap 5	12:32

10. Tom and Mary saw a bowl with candies. Tom took half of them at first, and then after a moment took 2 more. Mary then took half of the remaining ones. In the end there were 3 candies left. How many candies there were in the bowl in the begining?
A) 14   B) 16   C) 18   D) 20   E) 22

Questions for 4 points

11. Which tile must be added to the picture so that the white area is as large as the black area?

A) ☐   B) ◼   C) ◪   D) ◺   E) It is impossible

12. Henry and John started walking from the same point. Henry went 1 km north, 2 km west, 4 km south and finally 1 km west. John went 1 km east, 4 km south and 4 km west. Which of the following must be the final part of his walk in order to reach the same point as Henry?
A) He has already reached the same point   B) 1 km north   C) 1 km north-west
D) More than 1 km north-west   E) 1 km west

13. At the summer camp, 7 pupils eat ice cream every day, 9 pupils eat ice cream every second day and the rest of the pupils don't eat ice cream at all. Yesterday, 13 pupils had ice cream. How many pupils will eat ice cream today?
A) 7   B) 8   C) 9   D) 10   E) It cannot be determined

14. Kangaroos A, B, C, D and E are sitting in that order, clockwise, around a circular table. Exactly when the bell rings, each kangaroo but one exchanges its position with a neighbour. The resulting positions, clockwise and starting with A, are A, E, B, D, C. Which kangaroo did not move?
A) A   B) B   C) C   D) D   E) E

15. A square can be formed using four of these five pieces. Which one will not be used?
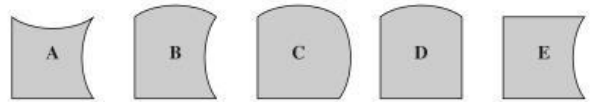
A) A   B) B   C) C   D) D   E) E

16. A natural number has three digits. When we multiply the digits we get 135. What result do we get if we add the digits?
A) 14   B) 15   C) 16   D) 17   E) 18

17. In a restaurant there are 16 tables, each having either 3, 4 or 6 chairs. Together, the tables having 3 or 4 chairs can accommodate 36 people. Knowing that the restaurant can accommodate 72 people, how many tables are there with 3 chairs?
A) 4   B) 5   C) 6   D) 7   E) 8

18. The points A, B, C, D, E, F are on a straight line in that order. We know that $AF = 35$, $AC = 12$, $BD = 11$, $CE = 12$ and $DF = 16$. What is the distance BE?
A) 13   B) 14   C) 15   D) 16   E) 17

19. Parisa set her stones in groups on the desk. After she arranged the stones in groups of 3, she found that there were 2 stones left. Then she arranged them in groups of 5, and again there were 2 stones left. At least how many more stones does she need so that there won't be any left when she arranges them in groups of 3 and in groups of 5?
A) 3   B) 1   C) 4   D) 10   E) 13

20. The faces of a cube are numbered 1, 2, 3, 4, 5, and 6. The faces 1 and 6 have a common edge. The same is true for faces 1 and 5, faces 1 and 2, faces 6 and 5, faces 6 and 4, and faces 6 and 2. Which number is on the face opposite the one with number 4?
A) 1   B) 2   C) 3   D) 5   E) It cannot be determined

Questions for 5 points

21. The $3 \times 3 \times 3$ cube in the picture 1 is made of 27 small cubes. At least how many small cubes do you have to take away to see the result shown in the picture 2 when looking at the cube from the right, from above, and from the front?
A) 4   B) 5   C) 6   D) 7   E) 9
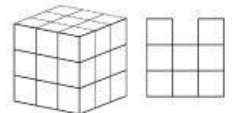
Picture 1   Picture 2

22. There are 5 songs: song A lasts 3 min, song B – 2 min 30 s, song C – 2 min, song D – 1 min 30 s, and song E – 4 min. These 5 songs are playing in the order A, B, C, D, E in a loop without any breaks. Andy left home when song C was starting to play. He returned home exactly one hour later. Which song was playing when Andy got home?
A) A   B) B   C) C   D) D   E) E