MATHEMATICS KANGAROO 2015
Austria - 23. 3. 2015

Level: Benjamin, Grade: 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 question left unanswered 0 Points
Each incorrect answer ¼ of the points for the question are subtracted

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

1	2	3	4	5	6	7	8

9	10	11	12	13	14	15	16

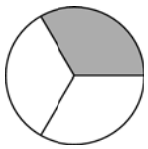
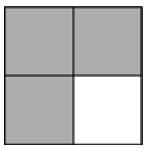
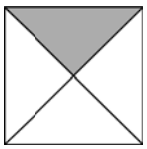
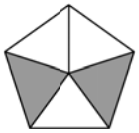
17	18	19	20	21	22	23	24

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

Mathematical Kangaroo 2015
Group Benjamin (Grade 5 and 6)
Austria - 23. 3. 2015

- 3 point questions -

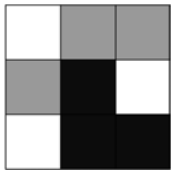
1. In which shape is exactly one half coloured grey?

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

2. The word KANGAROO is written on the top side of my umbrella. Which of the following pictures does not show my umbrella?

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

3. Sam paints the 9 small squares in the shape either white, grey or black. What is the minimum number he must paint over so that no two squares sharing a side have the same colour?

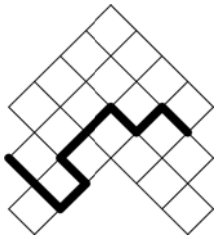


(A) 2 (B) 3 (C) 4 (D) 5 (E) 6

4. Mr Bauer has 10 ducks. 5 of these ducks lay an egg every day. The other 5 lay an egg every second day. How many eggs will the 10 ducks have laid after 10 days?

(A) 75 (B) 60 (C) 50 (D) 25 (E) 10

5. Each square in the shape has an area of 4 cm². How long is the thick line?

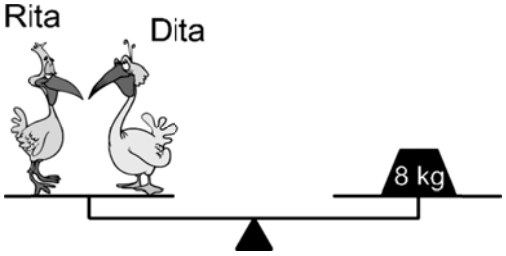


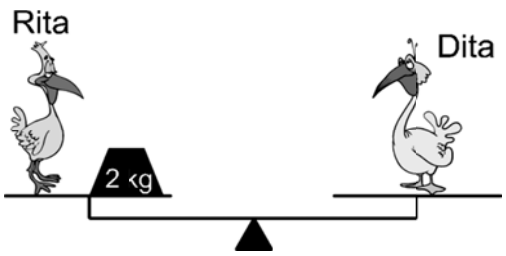
(A) 16 cm (B) 18 cm (C) 20 cm (D) 21 cm (E) 23 cm

6. Which of the following fractions is smaller than 2?

(A) $\frac{19}{8}$ (B) $\frac{20}{9}$ (C) $\frac{21}{10}$ (D) $\frac{22}{11}$ (E) $\frac{23}{12}$

7.

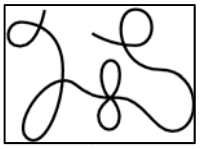




How much does Dita weigh?

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

8. Peter looks at the picture hanging on the wall in more detail through a magnifying glass. Which section can he not see?



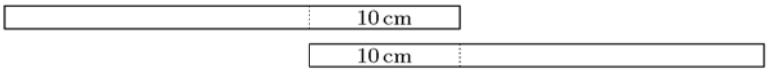
(A)  (B)  (C)  (D)  (E) 

- 4 point questions -

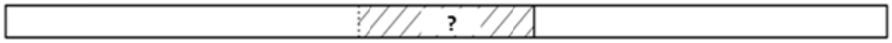
9. Each plant in Johns garden has exactly 5 leaves or exactly 2 leaves and a flower. In total the plants have 6 flowers and 32 leaves. How many plants are growing in the garden?

(A) 10 (B) 12 (C) 13 (D) 15 (E) 16

10. Andrea has 4 equally long strips of paper. When she glues two together with an overlap of 10cm, she gets a strip 50cm long.

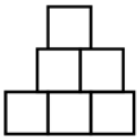


With the other two she wants to make a 56cm long strip. How long must the overlap be?



(A) 4 cm (B) 6 cm (C) 8 cm (D) 10 cm (E) 12 cm

11. Thomas has made the following shape with 6 squares of side length 1. What is the perimeter of the shape?

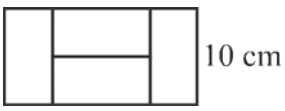


(A) 9 (B) 10 (C) 11 (D) 12 (E) 13

12. Each day Maria writes down the date and then adds together the individual digits. For instance today on the 23rd March she writes 23. 03. and calculates 2 + 3 + 0 + 3 = 8.
What is the largest total she make in this way in the course of a year?

(A) 7 (B) 13 (C) 14 (D) 16 (E) 20

13. A rectangle is formed from 4 equally sized smaller rectangles. The shorter side is 10cm long. How long is the longer side?



(A) 40 cm (B) 30 cm (C) 20 cm (D) 10 cm (E) 5 cm

14. In Field street there are 9 houses in a row. At least one person lives in each house. Each pair of neighbouring houses have at most 6 inhabitants. What is the maximum number of people living in Field street?

(A) 23 (B) 25 (C) 27 (D) 29 (E) 31

15. Lucy and her mother were both born in January. Today on 23rd March 2015 lucy adds together her year of birth, that of her mother, her age and that of her mother. Which answer does she get?

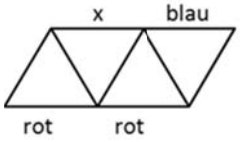
(A) 4028 (B) 4029 (C) 4030 (D) 4031 (E) 4032

16. A rectangle has area 12 cm². The lengths of the sides are natural numbers. Which perimeter could the rectangle have?

(A) 20 cm (B) 26 cm (C) 28 cm (D) 32 cm (E) 48 cm

- 5 point questions -

17. Each of the 9 sides of the triangles in the picture will be coloured blue, green or red. Three of the sides are already coloured. Which colour can side x have, if the sides of each triangle must be coloured in three different colours?

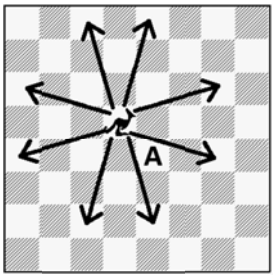


(A) only blue (B) only green (C) only red
(D) Each of the three colours is possible. (E) The colouring described is not possible

18. 3 green apples, 5 yellow apples, 7 green pears and 2 yellow pears are in a sack. Without looking, Sebastian takes either an apple or pear out of the sack. How many pieces of fruit must he take out of the sack to be sure of having at least one apple and one pear of the same colour?

(A) 9 (B) 10 (C) 11 (D) 12 (E) 13

19. For the game of Chess a new piece, the Kangaroo, has been invented. With each jump the kangaroo jumps either 3 squares vertically and 1 Horizontally, or 3 horizontally and 1 vertically, as pictured. What is the smallest number of jumps the kangaroo must make to move from its current position to position A?

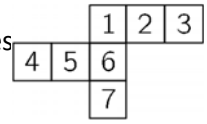


(A) 2 (B) 3 (C) 4 (D) 5 (E) 6

20. Sarah bought three books. For the first book she paid half of her money plus 1 Euro more. For the second book she paid again half of her left-over money plus 2 Euro's more. For the third book she paid again half of her left-over money plus 3 Euro's more. After which she had spent all of her money. How much money did she have to begin with?

(A) 45 € (B) 36 € (C) 34 € (D) 33 € (E) 30 €

21. Nina wants to make a cube from the paper net. You can see there are 7 squares Instead of 6. Which square(s) can she remove from the net, so that the other 6 squares remain connected and from the newly formed net a cube can be made?



(A) only 4 (B) only 7 (C) only 3 or 4 (D) only 3 or 7 (E) only 3, 4 or 7

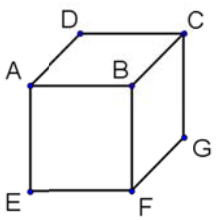
22. A train has 12 carriages. In each carriage there is the same number of compartments. Mike is sitting in the 18th compartment behind the engine, this is in the 3rd carriage. Joanna is sitting in the 50th compartment behind the engine, this is in the 7th carriage. How many compartments are in one carriage?

(A) 7 (B) 8 (C) 9 (D) 10 (E) 12

23. In how many ways can the three kangaroos be placed in three different squares so that no kangaroo has an immediate neighbour?

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

24. Maria writes a number on each face of the cube. Then, for each corner point of the cube, she adds the numbers on the faces which meet at that corner.
(For corner B she adds the numbers on faces BCDA, BAEF and BFGC.) In this way she gets a total of 14 for corner C, 16 for corner D, and 24 for corner E. Which total, does she get for corner F?



(A) 15 (B) 19 (C) 22 (D) 24 (E) 26