# MATHEMATICS KANGAROO 2011
# Austria - 17.3.2011

Group: Benjamin, Grades: 5-6

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|---|---|
| Name: | |
| School: | |
| Class: | |

Time allowed: 60 min.
Each correct answer, questions 1.-8.: 3 Points
Each correct answer, questions 9.-16.: 4 Points
Each correct answer, questions 17.-24.: 5 Points
Each question with no answer given: 0 Points
Each incorrect answer: Lose ¼ of the points for that question.
You begin with 24 points.

**Please write the letter (A, B, C, D, E) of the correct answer under the questions number (1 to 24)**
**Write neatly 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 |
|---|---|---|---|---|---|---|---|
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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

# Mathematics Kangaroo 2011
# Group Benjamin (Grades 5 and 6)
# Austria - 17.3.2011

**- 3 Point Questions -**

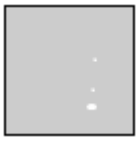
**1)** Bernd wants to paint the word KANGAROO. He begins on a Wednesday and paints one letter each day. On which day will he paint the last letter?

**A)** Monday **B)** Tuesday **C)** Wednesday **D)** Thursday **E)** Friday

**2)** A motorcycle driver covers a distance 28km in 30 minutes. What was his average speed in km/h?

**A)** 28 **B)** 36 **C)** 56 **D)** 58 **E)** 62

**3)** A square piece of paper is cut in a straight line into two pieces. Which of the following shapes can not be created?

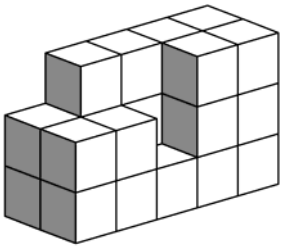


**A)** A Square **B)** A rectangle **C)** A right-angled triangle
**D)** A pentagon **E)** An equilateral triangle

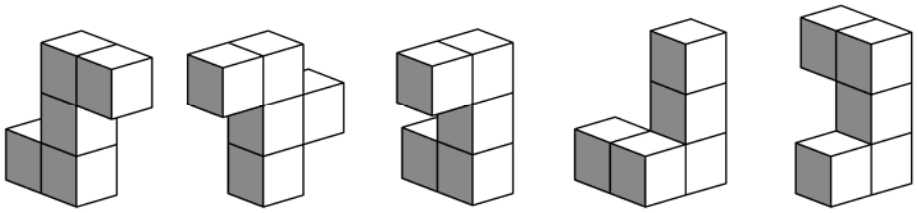
**4)** In Crazytown the houses on the right hand side of the street all have odd numbers. The Crazytowners don't use any numbers with the digit 3 in them. The first house on the right hand side has the number 1. Which number does the fifteenth house on the right hand side have?

**A)** 29 **B)** 41 **C)** 43 **D)** 45 **E)** 47

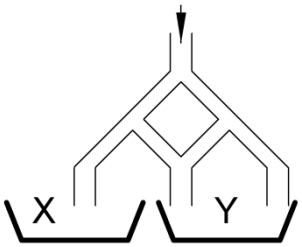
**5)** Which of the following pieces do I need to complete the cuboid?



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



**6)** 1000 litres of water is passed through the water system as shown, into two identical tanks. At each junction the water separates into two equal amounts. How many litres of water end up in Tank Y?




**A)** 800 **B)** 750 **C)** 666.67 **D)** 660 **E)** 500

**7)** The date 01-03-05 (1st March 2005) has three consecutive odd numbers. This is the first day in the 21st Century with this property. How many days with this property are there in total in the 21st Century?

**A)** 5 **B)** 6 **C)** 16 **D)** 13 **E)** 8

**8)** Andrew writes the letters from the word KANGAROO in the fields of a table. He can begin where he wants and then must write each consecutive letter in a field that shares at least one point with the previous field. Which of the following tables could Andrew not produce?

**A)**

| | |
|---|---|
| K | A |
| N | O |
| O | G |
| R | A |

**B)**

| | |
|---|---|
| N | G |
| A | A |
| K | R |
| O | O |

**C)**

| | |
|---|---|
| O | O |
| K | R |
| A | A |
| G | N |

**D)**

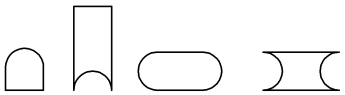
| | |
|---|---|
| K | A |
| N | G |
| O | O |
| R | A |

**E)**

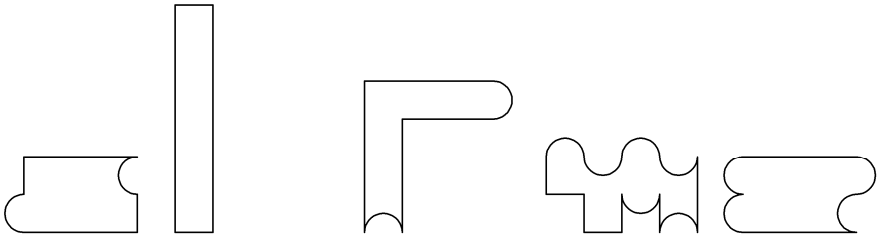
| | |
|---|---|
| K | O |
| A | O |
| R | N |
| A | G |

**- 4 Point Questions -**

**9)** A shape is made by fitting together the four pieces of card with no overlaps. Which of the following shapes is not possible?



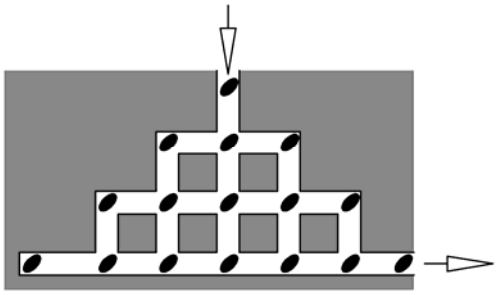
**A)** **B)** **C)** **D)** **E)**



**10)** When Liza the cat is very lazy and sits around the whole day, she drinks 60 ml of milk. When she chases mice she drinks a third more milk. In the past two weeks, she has chased mice on every second day. How much milk has she drunk in the past two weeks?

**A)** 840 ml **B)** 980 ml **C)** 1050 ml **D)** 1120 ml **E)** 1960 ml

**11)** Fridolin the hamster runs through the maze in the picture. 16 pumpkin seeds are laying on the path. He is only allowed to cross each junction once. What is the maximum number of pumpkin seeds that he can collect?

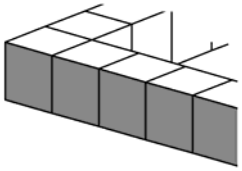


**A)** 12 **B)** 13 **C)** 14 **D)** 15 **E)** 16

**12)** All the four digit numbers with the same digits as 2011 (i.e. 0, 1, 1, 2) are written in a row in ascending order. What is the differrence between the two numbers that are next to 2011 in this list?

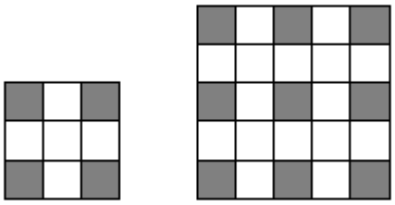
**A)** 890 **B)** 891 **C)** 900 **D)** 909 **E)** 990

**13)** Nina made a wall around a square area, using 36 identical cubes. A section of the wall is shown in the picture. How many cubes will she now need to completely fill the square area.



**A)** 36 **B)** 49 **C)** 64 **D)** 81 **E)** 100

**14)** Black and white tiles can be laid on square floors as shown in the pictures. We can see floors with 4 black and 9 black tiles respectively. In each corner there is a black tile, and each black tile touches only white tiles. How many white tiles would there be on a floor that had 25 black tiles?



**A)** 25 **B)** 39 **C)** 45 **D)** 56 **E)** 72

**15)** Paul wanted to multiply a whole number by 301, but forgot to include the zero and multiplied by 31 instead. His answer was 372. What should his answer have been?

**A)** 3010 **B)** 3612 **C)** 3702 **D)** 3720 **E)** 30720

**16)** In a tournament FC Barcelona scored a total of three goals, and conceded one goal. In the tournament the team had won one game, lost one game and drawn one game. What was the score in the game that FC Barcelona won?

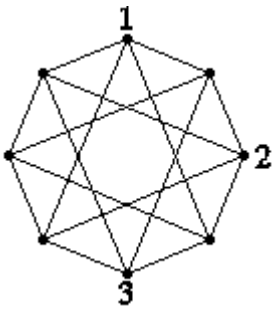
**A)** 2:0 **B)** 3:0 **C)** 1:0 **D)** 4:1 **E)** 0:1

## - 5 Point Questions -

**17)** If you are given the three corner points of a triangle and want to add a fourth point to make the four corners of a parallelogram. In how many places can the fourth point be placed?

**A)** 1 **B)** 2 **C)** 3 **D)** 4 **E)** That depends on the triangle.

**18)** The 8 corners of the shape in the picture are to be labelled with the numbers 1, 2, 3 or 4, so that the numbers at the ends of each of the lines shown are different. How often does the number 4 appear on the shape?




**A)** 1 **B)** 2 **C)** 3 **D)** 4 **E)** 5

**19)** Daniel wants to make a complete square using pieces only like those shown. What is the minimum number of pieces he must use?

**A)** 9 **B)** 10 **C)** 12 **D)** 16 **E)**20

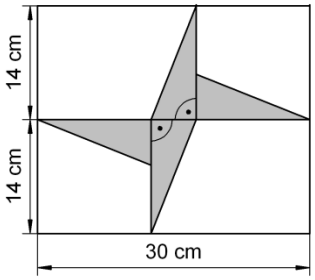
**20)** 10 children are at a judo club. Their teacher has 80 sweets. If he gives each girl the same amount of sweets, there are three sweets left over. How many boys are at the club?

**A)** 1 **B)** 2 **C)** 3 **D)** 5 **E)** 7

**21)** A cat had 7 kittens. The kittens had the colours white, black, ginger, black-white, ginger-white, ginger-black, and ginger-black-white. In how many ways can you choose 4 cats so that each time two of them have a colour in common.

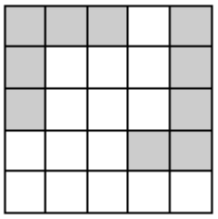
**A)** 1 **B)** 3 **C)** 4 **D)** 6 **E)** 7

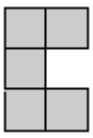
**22)** The picture shows a rectangle with four identical triangles. Determine the total area of the triangles.

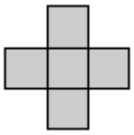



**A)** 46 cm² **B)** 52 cm² **C)** 54 cm² **D)** 56 cm² **E)** 64 cm²

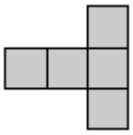
**23)** Lina has already laid two shapes on a square playing board. Which of the 5 shapes can she add to the board so that none of the remaining four shapes will have space to fit.

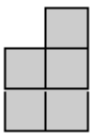


**A)** 

**B)** 

**C)** 

**D)** 

**E)** 

**24)** Numbers are to be built using only the digits 1, 2, 3, 4 and 5 in such a way that each digit is only used once in each number. How many of these numbers will have the following property; The first digit is divisible by one, The first 2 digits make a number which is divisible by 2, the first 3 digits make a number which is divisible by three, the first 4 digits make a number which is divisible by 4 and all 5 digits make a number which is divisible by 5.

**A)** It's not possible **B)** 1 **C)** 2 **D)** 5 **E)** 10