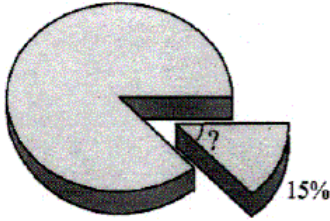


**European contest - game
"Math Kangaroo" 2003
Grades 7 and 8**

Part A: Each correct answer is worth 3 points.

1) 15% of a circular cake is cut as shown in the figure. How many degrees is the angle denoted by the question mark?

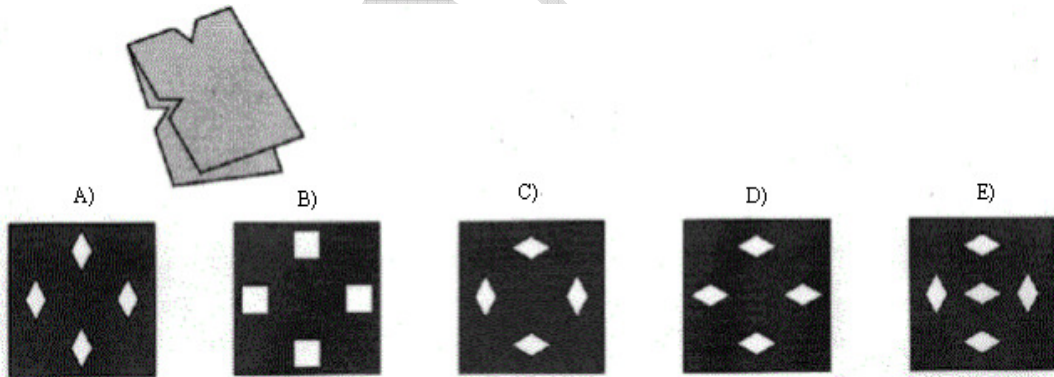


- A) 30° B) 45° C) 54° D) 15° E) 20°

2) There are 17 trees along the road from Basil's home to a pool. Basil marked some trees with a red strip as follows. On his way to bathe he has marked the first tree, and then each second tree, and on his way back, again, he has marked the first tree, and then each third tree. How many trees have no mark after that?

- A) 4 B) 5 C) 6 D) 7 E) 8

3) Which of the five square sheets corresponds to the folded sheet on the figure, which is cut, as shown?



4) A straight line is drawn across a 4x4 chessboard. What is the greatest number of 1x1 squares, which can be cut into two pieces by the line?

- A) 3 B) 4 C) 6 D) 7 E) 8

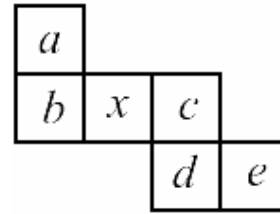
5) There were 5 parrots in the cage. Their average price was 6000 dollars. One day during the cleaning of the cage the most beautiful parrot flew away. The average price of the remaining four parrots was 5000 dollars. What was the price of the parrot, which escaped?



- A) 1000 dollars B) 2000 dollars C) 5500 dollars
D) 6000 dollars E) 10000 dollars

6) The net shown at the figure on the right is cut out and folded to form a cube. Which face is then opposite the face marked x?

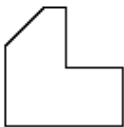
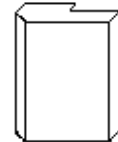
- A) a B) b C) c D) d E) e



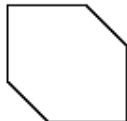
7) When going to Rimini by train, Lisa sat in the 7th carriage from the front, and Marco sat in front of her, in the 6th carriage from the back, with one carriage between Lisa's and Marco's. How many carriages were there in the train?

- A) 15 B) 14 C) 13 D) less than 13 E) not determined

8) Which of the following shapes corresponds to the upper face of the solid in the picture?



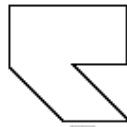
A)



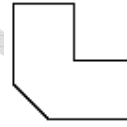
B)



C)



D)



E)

Part B: Each correct answer is worth 4 points.

9) In a triangle ABC the angle C is three times bigger than the angle A, the angle B is two times bigger than the angle A. Then the triangle ABC

- A) is equilateral
- B) is isosceles
- C) has an obtuse angle
- D) has a right angle
- E) has only acute angles

10) Ann and Barbara have the 3-digit number 888 which is clearly divisible by 8. Ann changes two of its digits in order to get the biggest 3-digit number, which is still divisible by 8. Barbara changes two of the digits of 888 in order to get the smallest 3-digit number, which is still divisible by 8. What is the difference of their two results?

- A) 800 B) 840 C) 856 D) 864 E) 904

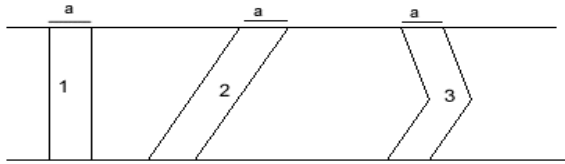
11) Consider all four-digit numbers that you can form each time taking the four digits of the number 2003. Adding all of them up you would get:

- A) 5005 B) 5555 C) 16665 D) 1110 E) 15555

12) Which of the following numbers is odd for every integer n ?

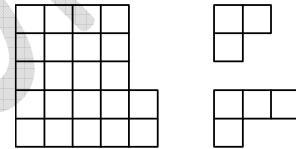
- A) $2003n$ B) $n^2 + 2003$ C) n^3 D) $n + 2004$ E) $2n^2 + 2003$

13) In the picture, three strips 1, 2, 3 are marked of the same horizontal width a . These strips connect the two parallel lines. Which strip has the biggest area?



- A) All three strips have the same area.
B) Strip 1.
C) Strip 2.
D) Strip 3.
E) It is impossible to answer without knowing a .

14) Carl tries to divide the figure on the left side of the drawing into smaller figures composed of three or four squares, as shown on the right side of the drawing. He may use only the lines of the square grid for doing that, and he must not leave any squares unused. What is the smallest number of three-square figures that he can achieve?



- A) 1 B) 2 C) 3 D) 4 E) Carl can't succeed

15) Mike has 42 identical cubes, each with the edge 1 cm long. He used all cubes to construct a rectangular prism. The perimeter of the base of that rectangular prism is 18 cm. What is its height?

- A) 1 cm B) 2 cm C) 3 cm D) 4 cm E) 5 cm

16) A is the number 11111...1111 formed by writing 2003 ones in a row. What is the sum of the digits of the product $2003 \times A$?

- A) 10000 B) 10015 C) 10020 D) 10030 E) 2003×2003

Part C: Each correct answer is worth 5 points.

17) When a barrel is 30% empty it contains 30 litres more than when it is 30% full. How many litres does the barrel hold when full?

- A) 60 B) 75 C) 90 D) 100 E) 120

18) The children A, B, C and D made the following assertions.

A: *B, C and D are girls.*

B: *A, C and D are boys.*

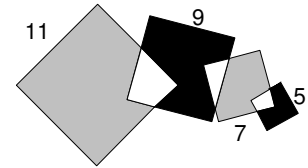
C: *A and B are lying.*

D: *A, B and C are telling the truth.*

How many of the children were telling the truth?

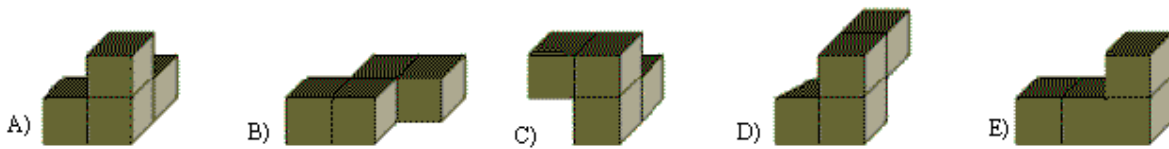
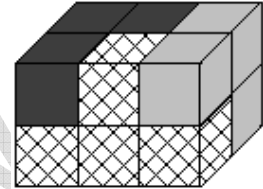
- A) 0 B) 1 C) 2 D) 3 E) Impossible to determine

19) In the picture there are four overlapping squares with sides 11, 9, 7 and 5 cm long. How much greater is the sum of the two grey areas than the sum of the two black areas?

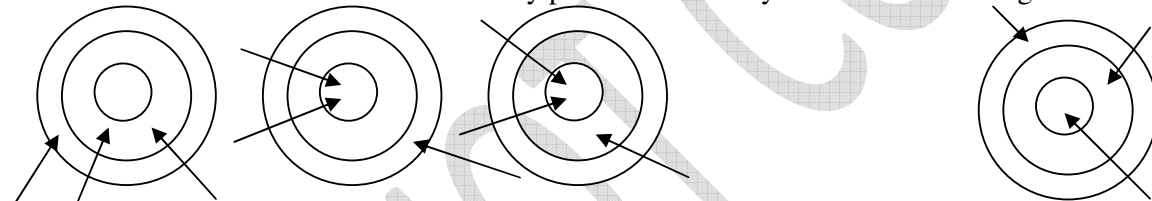


- A) 25 B) 36 C) 49 D) 64 E) 0

20) Using 3 bricks each consisting of 4 little cubes a rectangular prism has been built (see picture). The crosshatched brick is completely visible, both others – only partly visible. Which brick is the dark one?



21) Jeffrey throws three darts at each of four targets. He scores 29 points on the first target, 43 on the second and 47 on the third. How many points does Jeffrey score on the last target?



- A) 31 B) 33 C) 36 D) 38 E) 39

22) You have six sticks of lengths 1 cm, 2 cm, 3 cm, 2001 cm, 2002 cm and 2003 cm. You have to choose three of these sticks and form a triangle. How many different choices of three sticks are there that work?

- A) 1 B) 3 C) 5 D) 6 E) more than 50

23) The weight of a truck without load is 2000 kg. Today the load represents initially 80% of the total weight. At the first stop, they discharge a quarter of the load. What percentage of the total weight does then the load represent?

- A) 20% B) 25% C) 55% D) 60% E) 75%

24) Six points A, B, C, D, E, F are marked on a line from left to right, in the same order as listed. It is known that $AD = CF$ and $BD = DF$. Then, necessarily,

- A) $AB = BC$ B) $BC = DE$ C) $BD = EF$ D) $AB = CD$ E) $CD = EF$

Contest Game
“Math Kangaroo”
March 29, 2003

Answers

Grade 7-8

1	A B <u>C</u> D E	9	A B C <u>D</u> E	17	A <u>B</u> C D E
2	A <u>B</u> C D E	10	A B <u>C</u> D E	18	A <u>B</u> C D E
3	A B <u>C</u> D E	11	A B C D <u>E</u>	19	A B C <u>D</u> E
4	A B C <u>D</u> E	12	A B C D <u>E</u>	20	<u>A</u> B C D E
5	A B C D <u>E</u>	13	<u>A</u> B C D E	21	A B <u>C</u> D E
6	A B C D <u>E</u>	14	A <u>B</u> C D E	22	A B C <u>D</u> E
7	A B C <u>D</u> E	15	A B <u>C</u> D E	23	A B C D <u>E</u>
8	A B C D <u>E</u>	16	A <u>B</u> C D E	24	A B C <u>D</u> E