

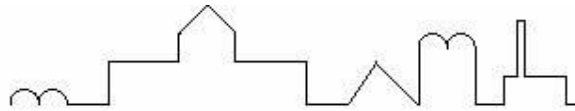
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Math Kangaroo 2002
Level of grades 5 - 6

Problems 3 points each

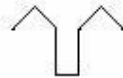
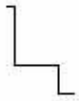
1. The number 2002 read from left to right and from right to left is the same. Which number from the numbers below does not have this property?

A) 1991 B) 2323 C) 2112 D) 2222 E) 4334

2.



The picture below is a sketch of a castle. Which of the lines below does not belong to the sketch?



A) B) C) D)

E)

3. Mr. and Mrs. Kowalski have three daughters. Each of them has two brothers. How many children does the Kowalski family have?

A) 9 B) 7 C) 6 D) 5 E) 11

4. In which number below is the square of the tens digit equal to the triple of the sum of the digits of hundreds and ones?

A) 192 B) 741 C) 385 D) 138 E) 231

5. The product $2^2 \cdot 2^{2000} \cdot 2$ is equal to: (\cdot denotes multiplication)

A) 2^{4000} B) 2^{2002} C) 2^{2003} D) 2^{4002} E) 2^{4001}

6.



On which string is the number of black hearts equal to two thirds of the number of all the hearts on that string?



A)

B)



C)

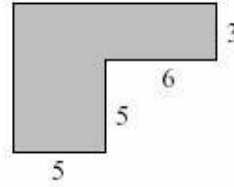


D)

E)

7. Which of the numbers below is the greatest? (\cdot denotes multiplication, $:$ denotes division)

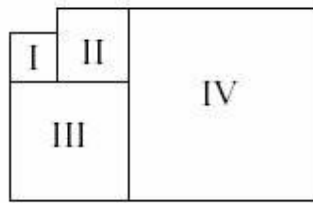
- A) $10 \cdot 0.001 \cdot 100$ B) $0.01 : 100$ C) $100 : 0.01$ D) $10,000 \cdot 100 : 10$ E) $0.1 \cdot 0.01 \cdot 10,000$



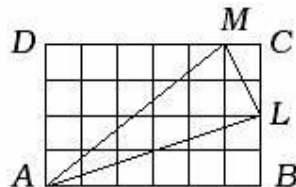
8. The area of the figure in the picture below is equal to:
 A) 43 B) 88 C) 58 D) 30 E) 15
9. The area of a certain rectangle is equal to 1 m^2 . What is the area of a triangle that was cut off from that rectangle along the line connecting the midpoints of the two adjacent sides?
 A) 33 dm^2 B) 25 dm^2 C) 40 dm^2 D) $3,750 \text{ cm}^2$ E) $1,250 \text{ cm}^2$
10. We subtracted the smallest three-digit number with all different digits from the greatest three-digit number with all different digits. The result was:
 A) 864 B) 885 C) 800 D) 899 E) Other number

Problems 4 points each

11. Figures I, II, III and IV are squares. The perimeter of square I is equal to 16 m, and the perimeter of square II is equal to 24 m. The perimeter of square IV is equal to:



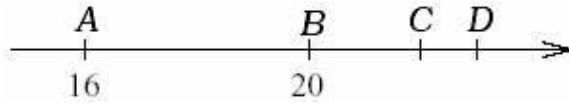
- A) 56 m B) 60 m C) 64 m D) 72 m E) 80 m
12. One medal can be cut out from a golden square plate. If four medals are made from four plates, the remaining parts of those four plates can be used to make one more plate. What is the largest number of medals that could be formed when 64 plates are used?
 A) 85 B) 64 C) 80 D) 84 E) 100



13. Rectangle ABCD (see the picture) is built out of 24 little squares with the length of each side equal to 1. What is the area of triangle ALM?

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

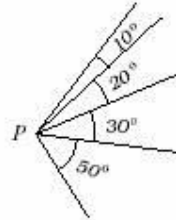
14. In the picture below the coordinates of points A and B were indicated. What are the coordinates of points C and D if $\div AB \div = 2 \div BC \div$, $\div BC \div = 2 \div CD \div$?



- A) 24 and 32 B) 24 and 28 C) 24 and 26 D) 22 and 24 E) 22 and 23

15. Mirek has 9 sticks with the lengths of 1 dm, 2 dm, 3 dm, 4 dm, 5 dm, 6 dm, 7 dm, 8 dm, 9 dm. With the sticks he builds triangles of which each side is built with one stick. How many triangles with a side of 1 dm can be built with those sticks?

- A) 6 B) 3 C) 2 D) 1 E) 0



16.

How many convex angles with different measures are made by the rays with P as the starting point (see the picture).

- A) 4 B) 6 C) 8 D) 10 E) 11

17. How many different three-digit numbers divisible by 25 can be made with the digits 0, 3, 5, 7 if the digits can be repeated?

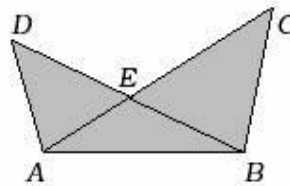
- A) 16 B) 9 C) 81 D) 64 E) 3

18. Each boy: Mietek, Mirek, Pawel, and Zbyszek has exactly one of the following animals: a cat, a dog, a gold fish, and a canary-bird. Mirek has a pet with fur. Zbyszek has a pet with four legs. Pawel has a bird, and Mietek and Mirek don't like cats. Which of the following sentences is not true?

- A/ Zbyszek has a dog. B/ Pawel has a canary. C/ Mietek has a golden fish.
D/ Zbyszek has a cat. E/ Mirek has a dog.

19. The next day after his birthday Jas said: "The day after tomorrow will be Thursday." On what day of the week did Jas have his birthday?

- A) On Monday B) On Tuesday C) On Wednesday D) On Thursday E) On Friday



20.

In the picture below, the area of triangle ABD is equal to 15, the area of triangle ABC is equal to 12 and the area of triangle ABE is equal to 4. What is the area of pentagon ABCED?

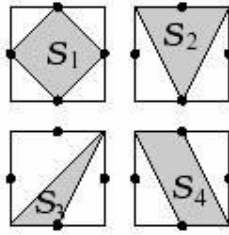
- A) 19 B) 31 C) 23 D) 27 E) 35

Problems 5 points each

21. The weight of each possible pair of boys from a group of 5 was recorded. The following results were obtained: 90 kg, 92 kg, 93 kg, 94 kg, 95 kg, 96 kg, 97 kg, 98 kg, 100 kg and 101 kg. The total weight of all five boys equals:

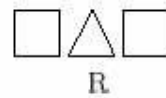
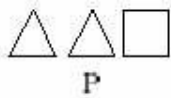
- A) 225 kg B) 230 kg C) 239 kg D) 240 kg E) 250 kg

22. There are four congruent squares. In each of them the midpoints of the sides are indicated and some regions with areas S_1, S_2, S_3 and S_4 are shaded. Which expression below is true?



- A) $S_3 < S_4 < S_1 = S_2$
 B) $S_3 < S_1 = S_2 = S_4$
 C) $S_3 < S_1 = S_4 < S_2$
 D) $S_3 < S_4 < S_1 < S_2$
 E) $S_4 < S_3 < S_1 < S_2$
23. You count from 1 to 100 and you clap when you say the multiples of number 3 and the numbers that are not multiples of 3 but have 3 as the last digit. How many times will you clap your hands?
- A) 30
 B) 33
 C) 36
 D) 39
 E) 43
24. The cyclist went up the hill with the speed of 12 km/h and went down the hill with the speed of 20 km/h. The ride up the hill took him 16 minutes longer than the ride down the hill. How many minutes did the cyclist take to go down the hill?
- A) 24
 B) 40
 C) 32
 D) 16
 E) 28

25.



Symbols P, Q, R, S indicate the total weight of the figures drawn above them.

It is known that any two figures of the same shape have the same weight. If $P < Q < R$, then:

- A) $P < S < Q$
 B) $Q < S < R$
 C) $S < P$
 D) $R < S$
 E) $R = S$
26. Ada has 14 gray balls, 8 white balls and 6 black balls in a bag. What is the least number of the balls she has to take out of her bag having her eyes closed to make sure that she took at least one ball of each color?
- A) 23
 B) 22
 C) 21
 D) 15
 E) 9

27. A computer virus destroys computer memory. On the first day it destroyed $\frac{1}{2}$ of this memory. On the second day it destroyed $\frac{1}{3}$ of the memory remaining after the first day; on the third day it destroyed $\frac{1}{4}$ of the memory remaining after two days and on the fourth day it destroyed $\frac{1}{5}$ of the memory remaining after three days. What part of all the computer memory was left after those four days?

- A) $\frac{1}{5}$
 B) $\frac{1}{6}$
 C) $\frac{1}{10}$
 D) $\frac{1}{12}$

1

E) $\frac{24}{12}$

28. What is the greatest value of the sum of the digits of the number made from the sum of the digits of a three-digit number?

A) 9
12

B) 10
E) 18

C) 11

D)

29. In the chess competition 32 players were competing. The competition was taking place by steps. In each step all the players were divided into groups of four. In each of these groups every player played once with every other player. The two best players from the group went to the next level and the two worst players were out of the competition. After the step in which four last players played, the two best players were playing an additional final game. How many games were played during the whole competition?

A) 49

B) 89

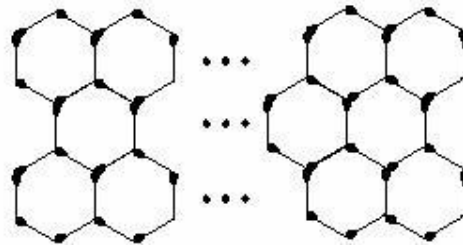
C) 91

D)

97

E) 181

30.



A net with 32 hexagonal spaces in three rows was made out of matches (see the picture.) How many matches were used to make this net?

A) 123

B) 124

C) 125

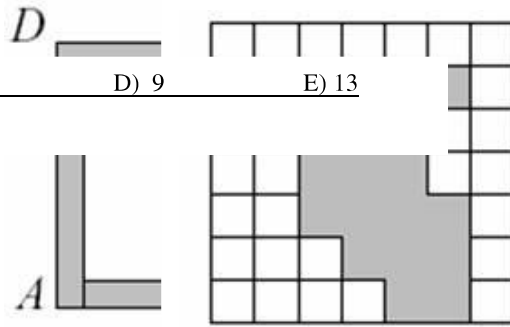
D) 120

E) 121

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~~A) 100 cm² B) 200 cm² C) 160 cm² D) 400 cm² E) 80 cm²~~

A) 6 B) 7 C) 8 D) 9 E) 13



Problems 3 points each

1. Which of the following numbers is greatest?

A) $2 + 0 + 0 + 3$ B) $2 \times 0 \times 0 \times 3$ C) $(2 + 0) \times (0 + 3)$ D) 2



2. Zosia is drawing flowers of different colors. The first flower is blue, then yellow, and so on in the same order. What is the color of the twenty ninth flower?

A) Blue B) White C) Red D) Pink E) Yellow

3. How many integers are there on the number line between the numbers 2.09 and 15.3?

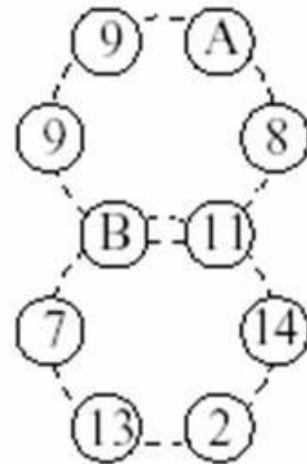
A) 13 B) 14 C) 11 D) 12 E) Infinitely many

4. The least positive integer which, is divisible by 2, 3, and 4, is:

A) 1 B) 6 C) 12 D) 24 E) 36

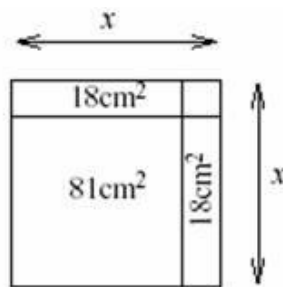
5. Two of the numbers located on the two circles (see the picture) are represented by letters A and B. The sum of the numbers on each circle is equal to 55. What number is represented by letter A?

A) 9 B) 10 C) 13 D) 16 E) 17



6. Tomek has 9 bills worth 100 zlotys each, 9 bills worth 10 zlotys each, and 10 coins worth 1 zloty each. How much money does Tomek have? (a zloty [zl] is a monetary unit in Poland)

A) 1,000 zl B) 991 zl C) 9, 910 zl D) 9,901 zl E) 99, 010 zl



7. A square with the length of side equal to x consists of a square with an area of 81 cm^2 , two rectangles with areas of 18 cm^2 each, and a small square. What is the value of x ?

A) 2 cm B) 7 cm C) 9 cm D) 10 cm E) 11 cm

8. The value of the expression $\frac{2003+2003+2003+2003+2003}{2003+2003}$ is equal to:

- A) 2003 B) $\frac{1}{3}$ C) 3 D) $\frac{5}{2}$ E) 6009

9. Basia likes to add the digits that indicate the actual time on her electronic watch (for example, when the watch shows 21:17, she gets the sum equal to 11). What is the greatest sum she can get? (Hint: in some countries and sometimes in USA, instead of telling it is 1P.M., people say it is 13:00. When it is 2P.M. they say it is 14:00, and when it is 12A.M., they say it is 24:00. In this problem 21:17 means 9:17P.M. Time expressed with this method is called *military time* sometimes.)

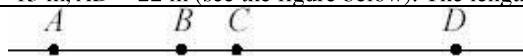
- A) 24 B) 36 C) 19 D) 25 E) 28

10. The picture shows Clown Jan dancing on two balls and a cube. The radius of the lower ball is 6 dm, and the radius of the upper ball is three times shorter. The edge of the cube is 4 dm longer than the radius of the upper ball. At what height is Jan dancing?

- A) 14 dm B) 20 dm C) 22 dm D) 24 dm E) 28 dm

Problems 4 points each

11. Let $AC = 10$ m, $BD = 15$ m, $AD = 22$ m (see the figure below). The length of segment BC is equal to

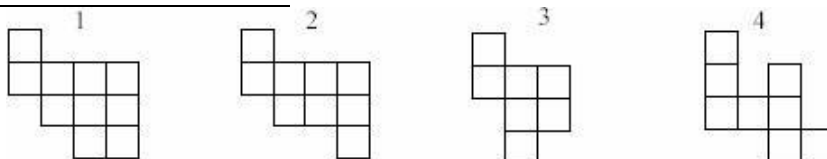


- A) 1 m B) 2 m C) 3 m D) 4 m E) 5 m

12. How many shortest distances along the edges of the cube are there that connect vertex A with the opposite vertex B ?

- A) 4 B) 6 C) 3 D) 12 E) 16

13. From a square puzzle two pieces are cut out. These two pieces made the shaded region, (see the figure). Among the four figures below, which are these two pieces?



- A) 1 and 4 B) 2 and 4 C) 2 and 3 D) 1 and 3 E) 3 and 4

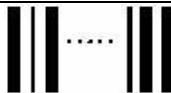
14. We add two different numbers chosen from the numbers: 1, 2, 3, 4, 5. How many different sums can we get?

- A) 5 B) 6 C) 7 D) 8 E) 9

15. The figure in the picture consists of 7 squares. Square A has the greatest area, and square B - the smallest area. The lengths of two of the squares are given. How many B squares will it take to fill up square A completely?

- A) 16 B) 25 C) 36 D) 49 E) It is impossible.

16. A certain bar code consists of 17 black bars. A white bar divides each two black bars. The first bar and the last bar in the code are black. There are two kinds of black bars: wide and narrow. The number of white bars is 3 more than the number of wide black bars. How many narrow black bars are there in this bar code?



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

17. Ewa has 20 balls of four colors: yellow, green, blue, and black. 17 of them are not green, 5 are black, and 12 are not yellow. How many blue balls does Ewa have?

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

18. There are 17 trees on one side of the street on Tomek's way from his house to school. One day Tomek marked these trees with white chalk in the following way: on the way from his house to the school he marked every other tree, starting with the first one. On his way back home he marked every third tree, starting with the first one. How many trees were not marked?

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

19. Today the date is 3.20.2003 and the time is 20:03 (8:03 P.M.) What will be the date after 2003 minutes?

- A) 3.21.2003 B) 3.22.2003 C) 3.23.2003 D) 4.21.2003 E) 4.22.2003

20. What is the digit of ones in the number 2003^{2003} ? A) 7 B) 1 C) 9 D) 5 E) 3

Problems 5 points each

21. With how many zeros does the product of the consecutive natural numbers from 1 to 50 end?

- A) 5 B) 10 C) 12 D) 20 E) 50

22. The square $ABCD$ consists of a white square and four shaded rectangles. Each of the rectangles has a perimeter of 40 cm. The area of square $ABCD$ equals:

29. Red and green dragons lived in a cave. Every red dragon had 6 heads, 8 legs, and 2 tails. Every green dragon had 8 heads, 6 legs, and 4 tails. There were 44 tails altogether, and there were 6 less green legs than red heads. How many red dragons lived in the cave?

- A) 6 B) 7 C) 8 D) 9 E) 10

30. Ania has 9 crayons in a box. At least one of them is blue. From every 4 crayons at least two are of the same color, and from every 5 crayons at most three are of the same color. How many blue crayons are in this box?

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

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3 points each

1. How much is $1000 - 100 + 10 - 1$?

- A) 111 B) 900 C) 909 D) 990 E) 999

2. In each of the little squares Karolina places one of the digits: 1, 2, 3, 4. She makes sure that in each row and each column each of these numbers is placed. In the figure below, you can see the way of filling these squares. What number should she put in the square marked with an x ?

1		x	2
4	1		
	3		
	2		

- A) 1 B) 2 C) 3 D) 4 E) Cannot be determined.

3. $(10 \cdot 100) \cdot (20 \cdot 80) =$

- A) $20,000 \cdot 80,000$ B) $2000 \cdot 8000$ C) $2000 \cdot 80,000$ D) $20,000 \cdot 8000$ E) $2000 \cdot 800$

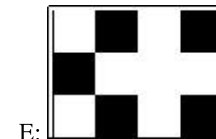
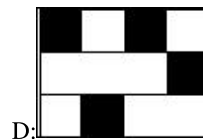
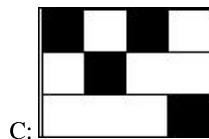
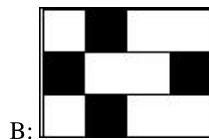
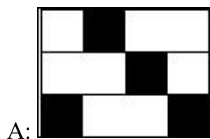
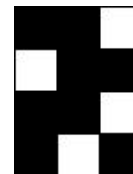
4. 360,000 seconds is:

- A) 3 hours B) 6 hours C) 8.5 hours D) 10 hours E) More than 90 hours.

5. What is the remainder when you divide 20042003 by 2004?

- A) 0 B) 1 C) 2 D) 3 E) 2003

6. Five identical sheets of a plastic rectangles were divided into white and black squares. Which of the sheets from A to E has to be covered with the sheet to the right in order to get totally black rectangle?



7. Which of the following numbers is not a factor of 2004?

- A) 3 B) 4 C) 6 D) 8 E) 12

8. The three members of a rabbit family ate 73 carrots altogether during a week. The father ate five carrots more than the mother. Their son ate 12 carrots. How many carrots did mother eat in that week?

- A) 27 B) 28 C) 31 D) 33 E) 56

9. Nine bus stops are equally spaced along a bus route. The distance between the first stop and the third one is 600 m. How long is the bus route?

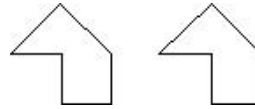
- A) 1800 m B) 2100 m C) 2400 m D) 2700 m E) 3000 m

10. The value of the expression $1 - (2 - (3 - (4 - 5)))$ is equal to:

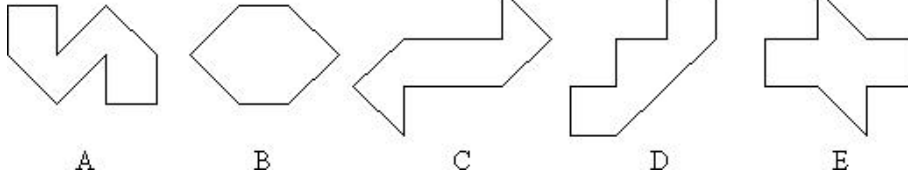
- A) 0 B) -3 C) -9 D) 3 E) 9

4 points each

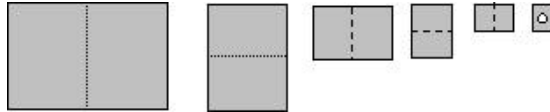
11. You are given two identical puzzle pieces and you are not allowed to turn them over.



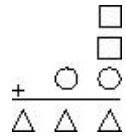
Which figure cannot be made out of these two pieces?



12. Karol folds a sheet of paper in a half and then repeats this four more times. Then he makes a hole in the folded paper. How many holes does the sheet of paper have after unfolding?



- A) 6 B) 10 C) 16 D) 20 E) 32



13. The different figures represent different digits. Find the digit corresponding to the square.

- A) 9 B) 8 C) 7 D) 6 E) 5

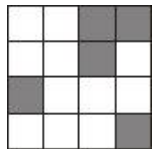
14. The weight of 3 apples and 2 oranges is 255 g. The weight of 2 apples and 3 oranges is 285 g. Each apple weighs the same and each orange weighs the same. What is the combined weight of 1 apple and 1 orange?

- A) 110 g B) 108 g C) 105 g D) 104 g E) 102 g

15. Tomek, Romek, Andrzej, and Michal said the following about a certain number: Tomek: "This number is equal to 9"; Romek: "This number is prime."; Andrzej: "This number is even."; Michal: "This number is equal to 15." Only one statement given either by Romek or Tomek is true, as well as only one statement given by either Andrzej or Michal is true. What number is it?

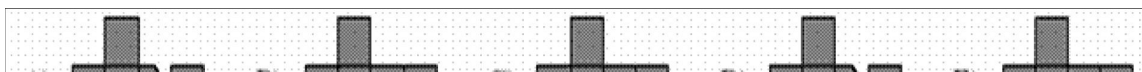
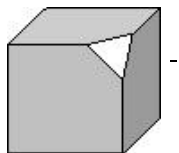
- A) 1 B) 2 C) 3 D) 9 E) 15

16. What is the smallest number of the little squares that have to be shaded in order to get at least one axis of symmetry of the figure below?



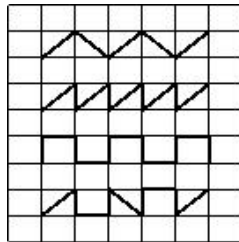
- A) 1 B) 2 C) 3 D) 4 E) 5

17. One corner of a cube was cut off. Which of the figure below represents the pattern of the cube after unfolding it?





18. Four snails: Fin, Pin, Rin, and Tin are moving along identical rectangular tiles. The shape and length of each snail's trip is shown below. How many decimeters has snail Tin gone?



Snail Fin has gone 25 dm.

Snail Pin has gone 37 dm.

Snail Rin has gone 38 dm.

Snail Tin has gone ? dm

- A) 27 dm B) 30 dm C) 35 dm D) 36 dm E) 40 dm

19. The Island of Turtles has an unusual weather system: Mondays and Wednesdays are rainy, Saturdays are foggy and the other days are sunny. A group of tourists would like to go on a 44-day long vacation to the island. Which day of the week should be the first day of their vacation in order to enjoy the most of the sunny days?

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

20. The sum of two natural numbers is equal to 77. If the first number is multiplied by 8 and the second by 6, then those products are equal. The larger of these numbers is:

- A) 23 B) 33 C) 43 D) 44 E) 54

5 points each

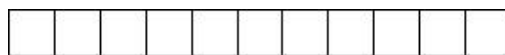
21. The number of all divisors of number $2 \cdot 3 \cdot 5 \cdot 7$ is equal to:

- A) 4 B) 14 C) 16 D) 17 E) 210

22. Ella and Ola had 70 mushrooms altogether. $\frac{5}{9}$ of Ella's mushrooms are brown and $\frac{2}{17}$ of Ola's mushrooms are white. How many mushrooms did Ella have?

- A) 27 B) 36 C) 45 D) 54 E) 10

23. There are 11 fields in the picture. Number 7 is written in the first field and number 6 in the ninth field. What number has to be placed in the second field so that the sum of the numbers from every three consecutive fields is equal to 21?



- A) 7 B) 8 C) 6 D) 10 E) 21

24. The square below was divided into small squares. What part of the area of the shaded figure is the area of the figure that is not shaded?

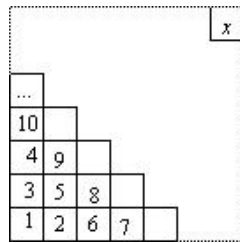


- A) $\frac{1}{4}$ B) $\frac{1}{5}$ C) $\frac{1}{6}$ D) $\frac{2}{5}$ E) $\frac{2}{7}$



25. In a CD store two CDs have the same price. The price of the first CD was reduced by 5 % and the price of the other one was increased by 15%. After this change the prices of the two CDs differ by \$6.00. How much is the cheaper CD now?

- A) \$1.50 B) \$6.00 C) \$28.50 D) \$30.00 E) 34.50



26. In the little squares of a big square the consecutive natural numbers are placed in a way shown in the figure. Which of the numbers below cannot be placed in the square with letter x ?

- A) 128 B) 256 C) 81 D) 121 E) 400

27. Ania divided number $\overbrace{111\dots1}^{2004}$ by 3. What is the number of zeros in the quotient?

- A) 670 B) 669 C) 668 D) 667 E) 665

28. Imagine that you have 108 red balls and 180 green balls. The balls have to be packed in boxes in such a way that every box contains the same number of balls and there are balls of only one color in every box. What is the smallest number of boxes that you need?

- A) 288 B) 36 C) 18 D) 8 E) 1

29. During a competition in the Kangaroo Summer Camp in Zakopane students were given 10 problems to solve. For each correct answer a student was given 5 points and for each incorrect one the student was loosing 3 points. Everybody solved all the problems. Mathew got 34 points, Philip got 10 points and John got 2 points. How many problems did they answer correctly all together?

- A) 17 B) 18 C) 15 D) 13 E) 21

30. A right triangle with legs of length 6cm and 8cm was cut out of a paper and then folded along a straight line. Which of the numbers below can express the area of the resulting polygon?

- A) 9 cm^2 B) 12 cm^2 C) 18 cm^2 D) 24 cm^2 E) 30 cm^2

[back to all](#)

[problems page](#)

Problems 3 points each

1. A butterfly sat down on a correctly solved problem. What number did it cover up?



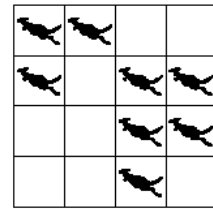
$$2005 + 205 = 3500 -$$

- A) 1295 B) 1190 C) 1390 D) 1195 E) 1290

2. Together, Anna and Olla have ten pieces of candy. Olla has two more pieces of candy than Anna. How many pieces of candy does Olla have?

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

3. There are eight kangaroos in the diagram (see the picture). What is the least number of kangaroos that have to be moved to the empty boxes in order to have two kangaroos in each row and each column?



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

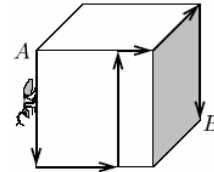
4. Eva lives with her parents, a brother, a dog, two cats, two parrots, and four gold fish. How many legs do they have altogether?

- A) 40 B) 32 C) 28 D) 24 E) 22

5. $2005 \times 100 + 2005 =$

- A) 2005002005 B) 20052005 C) 20072005 D) 202505 E) 22055

6. An ant is walking from point A to point B on a cube along the indicated path. The edge of the cube is 12 cm long. How far does the ant need to travel?



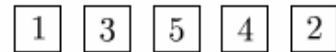
- A) 40 cm B) 48 cm C) 50 cm D) 60 cm E) 36 cm

7. On a shelf, there are 24 balls in three colors: white, red and brown. $\frac{1}{8}$ of

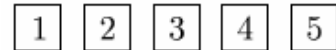
them are white, and $\frac{2}{3}$ of the rest of the balls are red. How many of them are brown?

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

8. There are five cards on the table, labeled with numbers 1 to 5 as shown in the top row. One move consists of switching two cards. How many moves do you need to make so that the cards are arranged in the way shown in the bottom row?



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



9. Tom picked a natural number and multiplied it by 3. Which number CANNOT be the result of this multiplication?

- A) 987 B) 444 C) 204 D) 105 E) 103

10. How many hours is half of a third part of a quarter of 24 hours?

- A) $\frac{1}{3}$ B) $\frac{1}{2}$ C) 1 D) 2 E) 3

Problems 4 points each

11. Eva cut a paper napkin into 10 pieces. She then also cut one of the pieces into 10 pieces. She repeated this process two more times. Into how many pieces did she cut the napkin?

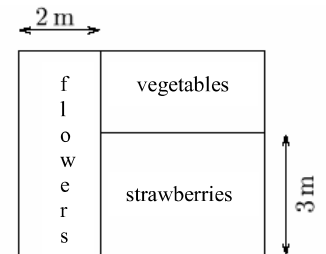
- A) 27 B) 30 C) 37 D) 40 E) 47

12. Mowgli usually walks from home to the beach, and returns on an elephant. It takes him 40 minutes altogether. One day he traveled on the elephant from home to the beach and back, which took him 32 minutes. How much time would he need to travel the same distance on foot?

- A) 24 min B) 42 min C) 46 min D) 48 min E) 50 min

13. A rectangular garden with an area of 30 m^2 was divided into three rectangular sections of flowers, vegetables, and strawberries (some of the dimensions are shown in the diagram). What is the area of the vegetable section, if the flower part has an area of 10 m^2 ?

- A) 4 m^2 B) 6 m^2 C) 8 m^2 D) 10 m^2 E) 12 m^2



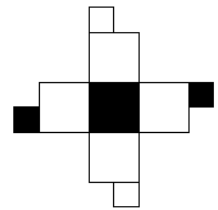
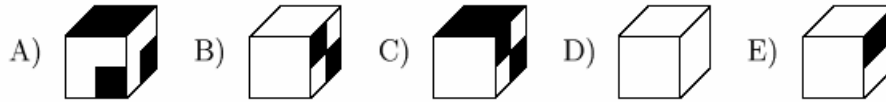
14. Grandpa suggested dividing all peanuts between the family members in the following way: one person would get 5 kilos, two people would get 4 kilos each, four people would get 2 kilos each, two people would get 1.5 kilo each, and one person would not get any nuts. Grandma suggested dividing the peanuts equally among all of the family members. For how many people would the division suggested by Grandma be better than the one suggested by Grandpa?

- A) 3 B) 4 C) 5 D) 6 E) 7

15. How many two digit numbers are there, which can be expressed only by using different odd digits?

- A) 15 B) 20 C) 25 D) 30 E) 50

16. Which of the cubes below represents the plan of the cube shown to the right?



17. Sum of five consecutive natural numbers is equal to 2005. The greatest number among them is:

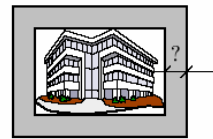
- A) 401 B) 403 C) 404 D) 405 E) 2001

18. The number of all divisors of number 100 is equal to

- A) 3 B) 6 C) 7 D) 8 E) 9

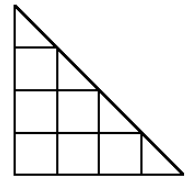
19. The frame of a rectangular painting was made out of wooden pieces of the same width. What is the width of those pieces if the outer perimeter of the frame is 8 decimeters longer than the inner perimeter?

- A) 4dm B) 2dm C) 1dm D) 8dm
E) The width depends on the dimensions of the painting.



20. How many more triangles than squares are shown in the picture?

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



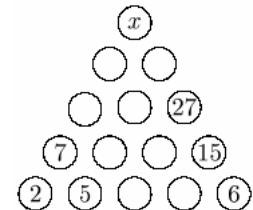
Problems 5 points each

21. There are five containers in a treasure chest, in each container there are three boxes and in each box there are 10 golden coins. The treasure chest, the containers, and the boxes are all locked. How many locks do you need to open to get 50 coins?

- A) 5 B) 7 C) 9 D) 6 E) 8

22. What number should replace x , if we know that the number in the circle in the upper row is the sum of the numbers from the two circles right below it.

- A) 32 B) 50 C) 55 D) 82 E) 100



23. In a two-digit number, a is the tens digit and b is the ones digit. Which of the conditions below ensures that the number will be divisible by 6?

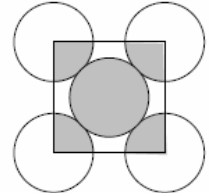
- A) $a + b = 6$ B) $b = 6a$ C) $b = 5a$ D) $b = 2a$ E) $a = 2b$

24. A wooden cube with the length of its side equal to 3 dm was painted with 0.25 kg of paint. The cube was then cut up into unit cubes (side length of 1 dm). How much paint is needed to paint the unpainted sides of the little cubes?

- A) 1.25 kg B) 1 kg C) 0.75 kg D) 0.5 kg E) 0.25 kg

25. Five circles have radii of the same length (see the picture). Four of them are touching the fifth circle, and their centers are the vertices of a square. The ratio of the area of the shaded region of the circles to the area of unshaded regions of the circles is:

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



26. From noon until midnight, Wise Cat sleeps under a chestnut tree. From midnight until noon he is awake telling stories. There is a note on that tree which says: "Two hours ago, Wise Cat was doing the same thing that he will be doing in an hour". How many hours, out of 24 hours, is the note true?

- A) 6 B) 12 C) 18 D) 3 E) 21

27. Mark has 42 cubes with side length of 1 cm. He used them to construct a prism, the base of which has a perimeter of 18 cm. The height of that prism is:

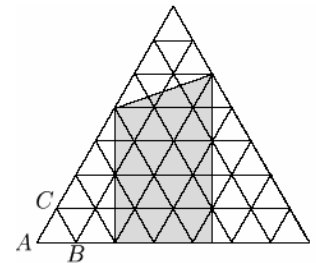
- A) 6 cm B) 5 cm C) 4 cm D) 3 cm E) 2 cm

28. On the board Peter wrote all the three-digit numbers that have the following properties: the digits in each of the numbers are different, the first digit is the square of the quotient of the second digit and the third digit. How many numbers did Peter write?

- A) 1 B) 2 C) 3 D) 4 E) 8

29. Equilateral triangle ABC (all sides congruent) has an area equal to 1. A bigger triangle was constructed out of 49 of these triangles (see the picture). The area of the shaded region is equal to:

- A) 20 B) 22.5 C) 23.5 D) 25 E) 32



30. Mary, Dorothy, Sylvia, Ella, and Kathy are sitting on a bench in the park. Mary is not sitting on the farthest right side; Dorothy is not sitting the farthest to the left. Sylvia is not sitting the farthest to the left nor the farthest to the right. Kathy is not sitting next to Sylvia, and Sylvia is not sitting next to Dorothy. Ella is sitting to the right of Dorothy, but not necessarily next to her. Which girl is sitting the farthest to the right?

- A) It cannot be determined. B) Dorothy C) Sylvia D) Ella E) Kathy

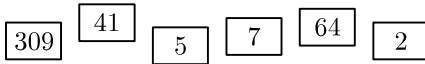
Math Kangaroo 2005

Level of grades 5 - 6


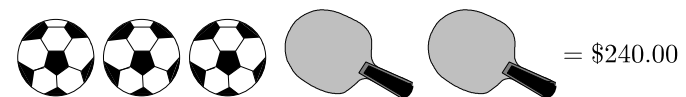


3 POINTS FOR EACH PROBLEM


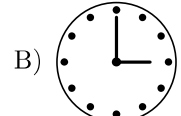
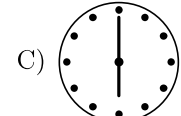
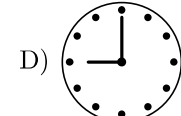
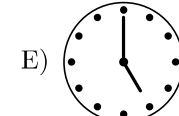
1. If $3 \times 2006 = 2005 + 2007 + a$, then a is equal to:
 A) 2003 B) 2004 C) 2005 D) 2006 E) 2007

2. What is the greatest number we can get arranging six cards in one row, one after another, with numbers shown in the picture?

 A) 6 475 413 092 B) 4 130 975 642 C) 3 097 564 241 D) 7 564 413 092 E) 7 645 413 092

3. There are places for 4 people at a square table, one on each side. Students put together 10 such tables, one after another, in one row so they got one rectangular table. How many places are there at the rectangular table now?
 A) 40 B) 32 C) 30 D) 22 E) 20

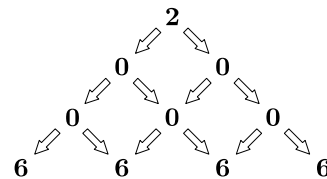
4. There is an advertisement in a sport store:
 

- How much is a ball?
 A) \$130 B) \$60 C) \$50 D) \$40 E) \$30

5. On which picture the hands of the clock form an angle with measure of 150° ?
    

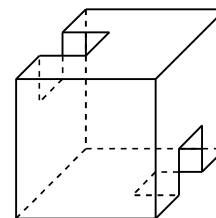
6. On one side of Long Street there are houses numbered by consecutive odd numbers from 1 to 39, and on the other side, houses are numbered by consecutive even numbers from 2 to 34. How many houses are there on Long Street?
 A) 37 B) 38 C) 28 D) 36 E) 73

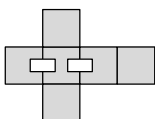
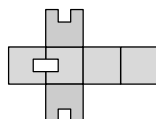
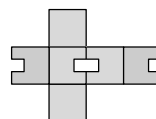
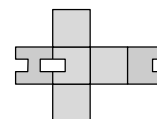
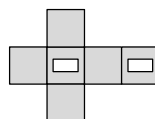
7. With how many ways can you get the number 2006 while following the arrows on the figure?
 A) 12 B) 11 C) 10 D) 8 E) 6



8. A half of one one hundredth is:
 A) 0.005 B) 0.002 C) 0.05 D) 0.02 E) 0.5

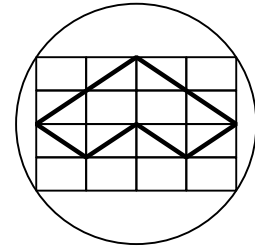
9. Out of which figure below can you make the box shown in the picture?



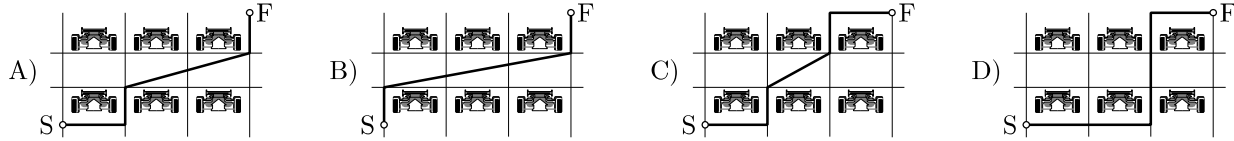
- A)  B)  C)  D)  E) 

18. The diameter of the circle in the picture is 10. What is the perimeter of the figure marked with the bold line?

- A) 8 B) 16 C) 20 D) 25 E) 30



19. Six cars are parked in a parking lot in two rows. Which of the paths from S to F is the shortest?



E) All are equal.

20. Anne added the biggest two-digit number divisible by 3 to the smallest two-digit number divisible by 3. Adam added the biggest two-digit number not divisible by 3 to the smallest two-digit number not divisible by 3. How much bigger is the sum that Anne calculated than the sum that Adam calculated?

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

5 POINTS FOR EACH PROBLEM

21. On segment OE with a length of 2006, we place points A , B , and C so that length $|OA| = |BE| = 1111$ and $|OC| = 70\%|OE|$. What is the order of points A , B , and C on the segment OE ?

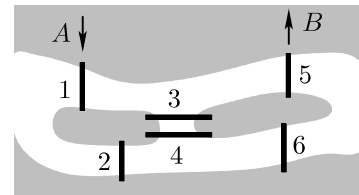
- A) A, B, C B) A, C, B C) C, B, A D) B, C, A E) B, A, C

22. A rope 15 inches long has been divided into the greatest possible number of pieces in such a way that each piece has a different length which is expressed by a whole number of inches. How many cuts were made?

- A) 3 B) 4 C) 5 D) 6 E) 15

23. There are two islands on a river that goes through a city. There are six connecting bridges as shown in the picture. If we want to travel from point A to point B , starting the journey at bridge 1 and going through each bridge only once, then how many possible routes are there?

- A) 0 B) 2 C) 4 D) 6 E) More than 6.

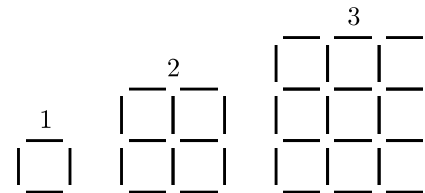


24. Which set of three numbers represents three points on a number line where one of them is a midpoint of a segment with ends represented by the other two numbers?

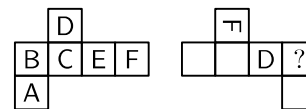
- A) $\frac{1}{3}; \frac{1}{4}; \frac{1}{5}$ B) 12; 21; 32 C) $\frac{1}{10}; \frac{9}{80}; \frac{1}{8}$ D) 0,3; 0,7; 1,3 E) 24; 48; 64

25. Barbara is creating different squares with sticks of equal length. She numbers them with numbers 1, 2, 3, etc. How many more sticks will she use to create the 31st square than the 30th square?

- A) 148 B) 61 C) 254 D) 120 E) 124



26. There are two figures of one cube (see the picture). On each side of the cube one letter was written. On the second figure only two sides have letters on them, on the remaining sides the letters have been erased. What letter was erased from the side that was marked with the question mark?



A) A B) B C) C D) E E) Impossible to determine.

27. A cistern delivered gas to three different gas stations. At the first one 30% of the gas was taken out, at the second gas station 40% of the remaining gas in the cistern was taken out, and at the third station half of the remaining gas was taken out. What percent of the initial amount of gas is left in the cistern?

A) 21 B) 10 C) 12 D) 14 E) 15

28. In one class $\frac{1}{8}$ of the students received a C on the math exam, $\frac{1}{6}$ received a B, and $\frac{2}{3}$ received an A. There were no D's or A+'s. How many students received an F if there were less than 30 students in the class?

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

29. Three friends: Adam, Tom, and Paul went to the swimming pool 15 times. Adam bought the tickets for all of them 8 times and Tom did the same 7 times. Paul gave back 30 dollars to his friends, that, as he calculated, he owed for the pool tickets. How should Adam and Tom split those 30 dollars so that each boy pays the same amount for the pool?

A) \$22 for Adam and \$8 for Tom B) \$20 for Adam and \$10 for Tom
 C) \$15 for Adam and \$15 for Tom D) \$16 for Adam and \$14 for Tom
 E) \$18 for Adam and \$12 for Tom

30. On a blackboard, all whole numbers from 1 to 2006 were written. John underlined all numbers divisible by 2, Adam underlined all numbers divisible by 3 and Peter underlined all numbers divisible by 4. How many numbers were underlined exactly twice?

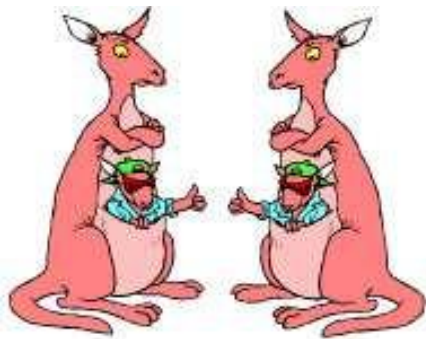
A) 1003 B) 668 C) 501 D) 334 E) 167

MATHEMATICS

KANGOUROU COMPETITION

2007

**NICOSIA
MARCH, 2007**



KANGOUROU 2007

MATHEMATICS

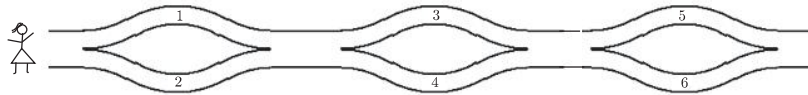
ENGLISH VERSION

LEVEL 03-04

Attention! Questions from 01-08 carry 4 points each, questions 09-16 carry 5 points each and questions 17-24 carry 6 points each. The maximum score is 120 points.

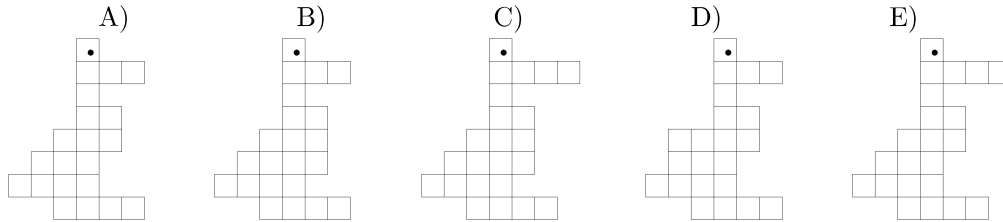
4 points questions

1. Zita walks from the left to the right and puts the numbers in her basket. Which of the following numbers can be in her basket?



- A) 1, 2 and 4 B) 2, 3 and 4 C) 2, 3 and 5 D) 1, 5 and 6 E) 1, 2 and 5
-

2. In what figure do you find the biggest number of little squares?



3. How many common letters do the words *KANGAROO* and *PROBLEM* have?

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

4. What is the first number greater than 2007 such that the sum of the digits is the same?

- A) 2016 B) 2115 C) 2008 D) 7002 E) 2070
-

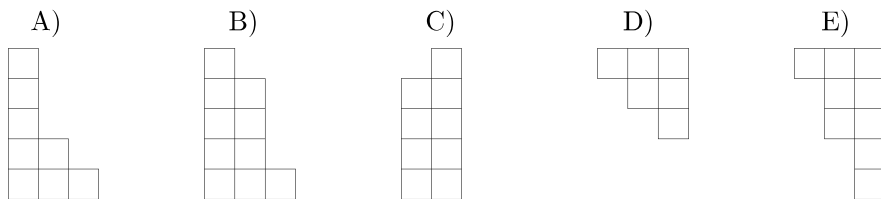
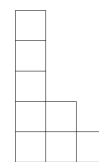
5. There are 9 lampposts on one side of the path in the park. The distance between each pair of neighbouring lampposts is 8 metres. George was jumping all the way from the first lamppost to the last one. How many metres has he jumped?

A) 48 B) 56 C) 64 D) 72 E) 80

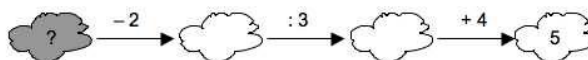
6. The combination for opening a safe is a three digit number made up of different digits. How many different combinations can you make using only digits 1, 3 and 5?

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

7. What is the piece that fits together with the given one to form a rectangle?



8. Which number needs to be put into the dark cloud, to have all the given calculations right?



A) 1 B) 3 C) 5 D) 7 E) 9

5 points questions

- 9.

$$4 \times 4 + 4 + 4 + 4 + 4 + 4 + 4 \times 4 = ?$$

A) 32 B) 44 C) 48 D) 56 E) 100

10. In the square below the numbers 1, 2 and 3 must be written in the cells. In each row and in each column each of the numbers 1, 2 and 3 must appear. Harry started to fill in the square. Which number can be written in the cell with the question mark?

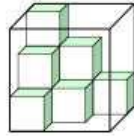
1	?	
2	1	

A) only 1 B) only 2 C) only 3 D) 2 or 3 E) 1, 2 or 3

11. Hermenegilda has 5 euro. She intends to buy 5 exercise-books, 80 euro-cents each, and some pencils, 30 euro-cents each. At most how many pencils is she able to buy?

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

12. Daniela has got cubes with their edges 1 dm long. She has put some of them into the aquarium in the shape of a cube with the edges measuring 3 dm in the way you see on the picture. What maximum number of further cubes can she put into the aquarium?



A) 9 B) 13 C) 17 D) 21 E) 27

13. Basil, who is older than Pete by 1 year and 1 day, was born on January 1, 2002. What is the date of Pete's birth?

A) January 2, 2003 B) January 2, 2001 C) December 31, 2000
D) December 31, 2002 E) December 31, 2003

14. John has 400 spaghetti strands, each 15 cm long, on his lunch plate. If he joined them end to end (using sauce as glue) to form one long strand, the length of his lunch would be?

A) 6 km B) 60 m C) 600 cm D) 6000 mm E) 60000 cm

15. Peter wrote a one-digit number and then wrote an additional digit on its right. He added 19 to the obtained number and got 72. What number did Peter write first?

A) 2 B) 5 C) 6 D) 7 E) 9

16. Digital clock shows the time 20 : 07. What the minimal time should pass in order to the same four digits (in some order) appear on the clock?

A) 4 h 20 min B) 6 h 00 min C) 10 h 55 min D) 11 h 13 min E) 24 h 00 min
