

Questions of Kangaroo 2004

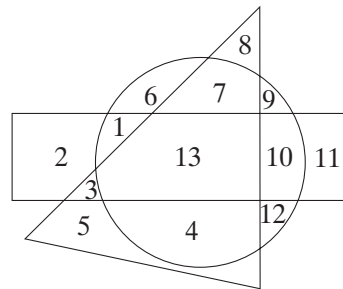
MINOR (grades 3 and 4)

3-POINT QUESTIONS

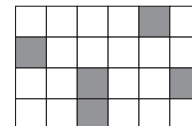
- M1.** How much is $2001 + 2002 + 2003 + 2004 + 2005$?
A 1015 **B** 5010 **C** 10,150 **D** 11,005 **E** 10,015
- M2.** Jerome was 4 years old when his sister was born. Today he blows out 9 birthday candles. What is the age difference between him and his sister?
A 4 years **B** 5 years **C** 9 years **D** 13 years **E** 14 years
- M3.** In the picture below you can see a road from town M to town N (a solid line) and a detour (a dashed line) of segment KL , which is under repair. How many more kilometers does one have to travel from M to N using the detour?



- A** 3 **B** 5 **C** 6 **D** 10 **E** Impossible to calculate
- M4.** There were some swallows on a telegraph line. All at once 5 of them flew away, and a while later 3 swallows came back. Then there were 12 swallows on the line. How many swallows were there on the line at the very beginning?
A 8 **B** 9 **C** 10 **D** 12 **E** 14
- M5.** Which numbers are written in the area that belongs to the rectangle and to the circle but doesn't belong to the triangle?
A 5 and 11 **B** 1 and 10 **C** 13
D 3 and 9 **E** 6, 7, and 4

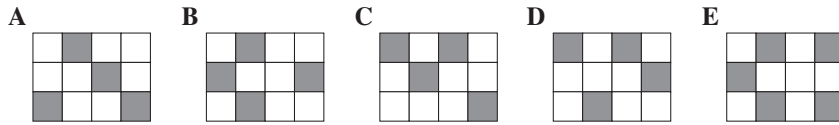
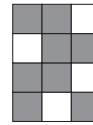


- M6.** How many white squares must you paint grey so that the number of grey squares is exactly half that of the white squares?
A 2 **B** 3 **C** 4 **D** 6 **E** It cannot be done



- M7.** Mary and Peter's classmates are standing in line. Mary has 16 students in back of her, including Peter. Peter has 14 students in front of him including Mary. Between Mary and Peter there are 7 students. How many students are there, altogether, in Mary and Peter's class?
A 37 **B** 30 **C** 23 **D** 22 **E** 16

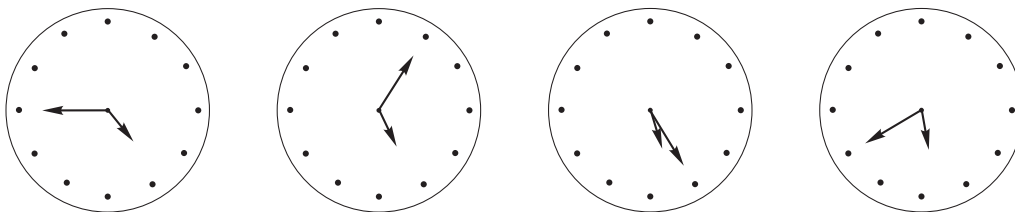
M8. Which of the rectangles **A** to **E** can be covered by the pattern on the right-hand side in such a way that the result is a totally black rectangle?



4-POINT QUESTIONS

M9. The weight of 3 apples and 2 oranges is 255 g. The weight of 2 apples and 3 oranges is 285 g. Each apple has the same weight, and each orange has the same weight. What is the weight in grams of 1 apple and 1 orange together?
A 110 **B** 108 **C** 105 **D** 104 **E** 102

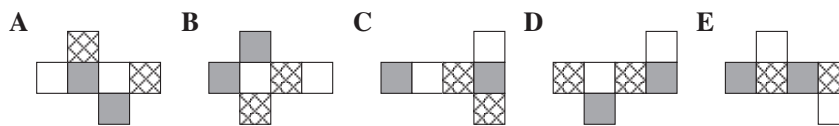
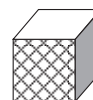
M10. In this picture there is what I saw on four different clocks at the same time. Only one of them had the right time. One was 20 minutes fast. Another 20 minutes slow. One had stopped some time ago.



What was the right time?
A 4:45 **B** 5:05 **C** 5:25 **D** 5:40 **E** 12:00

M11. Gabriella brought Joseph a basket of apples and oranges. Joseph ate half of all the apples and one third of all the oranges. How much of the fruit could still be left in the basket?
A Half of all the fruit **B** More than half of all the fruit
C Less than half of all the fruit **D** One third of all the fruit
E Less than one third of all the fruit

M12. A cube (on the right) is colored in three colors so that each face has exactly one color and the opposite face has the same color. Which of the following developments is the development of this cube?



M13. Karen has found an old book with some missing pages. On a left-hand page the page number is 24, and the following right-hand page is numbered 45. How many leaves are missing in between?
A 9 **B** 10 **C** 11 **D** 20 **E** 21

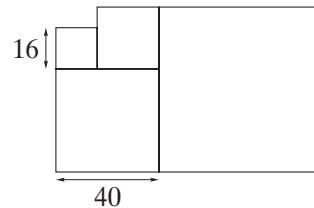
M14. Ruby is 52 days older than her classmate Irene. Last year Ruby celebrated her birthday on a Tuesday in March. On which day of the week did Irene celebrate her birthday last year?
A Monday **B** Tuesday **C** Wednesday **D** Thursday **E** Friday

- M15.** Which difference is not equal to $671 - 389$?
A $771 - 489$ **B** $681 - 399$ **C** $669 - 391$ **D** $1871 - 1589$ **E** $600 - 318$

- M16.** Inside each of the four squares of a 2×2 grid there is a number. If the sum of the numbers of the first line is 3, the sum of the numbers of the second line is 8, and the sum of the numbers of the first column is 4, what is the sum of the numbers in the second column?
A 4 **B** 6 **C** 7 **D** 8 **E** 11

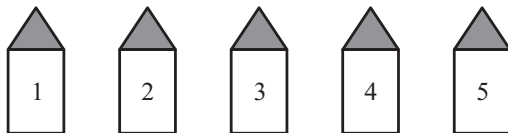
5-POINT QUESTIONS

- M17.** This figure is made of squares. What is the side of the biggest square?
A 24 **B** 56 **C** 64 **D** 81 **E** 100



- M18.** Robert has 147 euros, and Lisa has 57 euros. How many euros must Robert give to Lisa so that Robert has twice as much as Lisa?
A 11 **B** 19 **C** 30 **D** 45 **E** 49

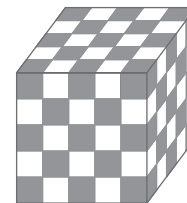
- M19.** There are five houses on Color Street: a blue, a red, a yellow, a pink, and a green one. The houses are numbered from 1 to 5 (see picture). The red house is the neighbor of the blue house only. The blue house stands between the green and red houses.



- Which color is the house with number 3?
A Blue **B** Red **C** Yellow **D** Pink **E** Green

- M20.** The sum of the digits of a ten-digit number is equal to 9. What is the product of the digits of this number?
A 0 **B** 1 **C** 45 **D** $9 \cdot 8 \cdot 7 \cdot 6 \cdot 5 \cdot 4 \cdot 3 \cdot 2$ **E** Depends on the given number

- M21.** A large cube consists of 125 small black and white cubes, such that any two adjacent faces of the small cubes have different colors, the corner cubes being black. How many small black cubes are used?
A 62 **B** 63 **C** 64 **D** 65 **E** 68



- M22.** One lottery ticket costs 4 euros. Three boys – Paul, Peter, and Robert – pooled their money for two tickets. Paul gave 1 euro, Peter – 3 euros, Robert – 4 euros. One of the tickets they bought won 1000 euros. The boys shared the prize fairly, i.e., according to how much money each of them had contributed. How many euros did Peter get?
A 300 **B** 375 **C** 250 **D** 750 **E** 425

M23. After three games of the soccer championship, Platypus United has scored three goals and let one past them. They get three points for a win, one point for a draw, and no points for a loss. How many points can they not have right now?

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

M24. This is a multiplication table. Which two letters represent the same number?

- A** *L* and *M* **B** *P* and *N* **C** *R* and *S*
D *K* and *R* **E** *M* and *T*

| | | | | |
|---|----------|----------|----------|----------|
| × | | | | 7 |
| | <i>J</i> | <i>K</i> | <i>L</i> | 56 |
| | <i>M</i> | 36 | 8 | <i>N</i> |
| | <i>P</i> | 27 | 6 | <i>R</i> |
| 6 | 18 | <i>S</i> | <i>T</i> | 42 |

BENJAMIN (grades 5 and 6)

3-POINT QUESTIONS

B1. How much is $1000 - 100 + 10 - 1$?

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

B2. Caroline wants to write the numbers 1, 2, 3, 4 in the square 4×4 in such a way that every row and every column has each number. You see how she started. What number must be put in the place of *x*?

- A** 1 **B** 2 **C** 3 **D** 4 **E** Impossible to determine

| | | | |
|---|---|----------|---|
| 1 | | <i>x</i> | 2 |
| 4 | 1 | | |
| | 3 | | |
| | 2 | | |

B3. The product $(10 \times 100) \times (20 \times 80)$ is equal to

- A** $20,000 \times 80,000$ **B** 2000×8000 **C** $2000 \times 80,000$ **D** $20,000 \times 8000$ **E** 2000×800

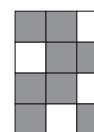
B4. How many hours is 360,000 seconds?

- A** 3 **B** 6 **C** 8.5 **D** 10 **E** More than 90

B5. If 20042003 is divided by 2004, the remainder is

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

B6. Which of the rectangles **A** to **E** can be covered by the pattern on the right-hand side in such a way that the result is a totally black rectangle?



A



B



C



D



E



B7. Which of the following is not a factor of 2004?

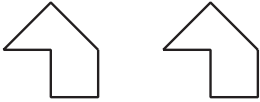

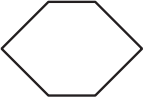
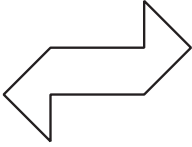
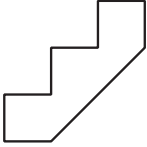
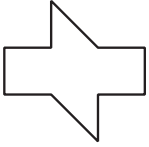
- A** 3 **B** 4 **C** 6 **D** 8 **E** 12

B8. The three members of a rabbit family have altogether eaten 73 carrots. The father has eaten five carrots more than the mother. The son Bunny has eaten 12 carrots. How many carrots has the mother eaten?

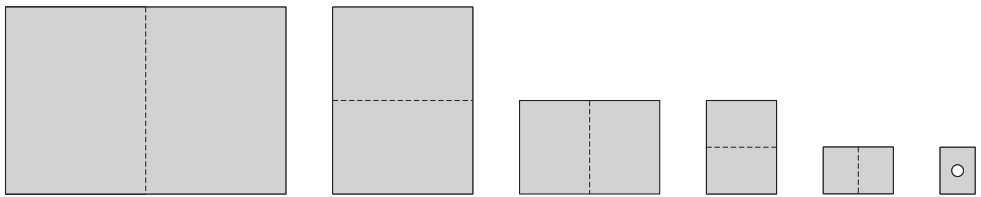
- A** 27 **B** 28 **C** 31 **D** 33 **E** 56

- B9.** Nine bus stops are equally spaced along a bus route. The distance from the first stop to the third stop is 600 m. How many meters is it from the first to the last?
A 1800 **B** 2100 **C** 2400 **D** 2700 **E** 3000
- B10.** The sum of the digits of a ten-digit number is equal to 9. What is the product of the digits of this number?
A 0 **B** 1 **C** 45 **D** $9 \cdot 8 \cdot 7 \cdot 6 \cdot 5 \cdot 4 \cdot 3 \cdot 2$ **E** Depends of the given number

4-POINT QUESTIONS

- B11.** You have two identical pieces that you can turn around but not upside down. Which picture can you not make with these two pieces?
- 
- A**  **B**  **C**  **D**  **E** 

- B12.** Harry folds a sheet of paper five times. Then he makes a hole in the folded paper, after which he unfolds it.



- How many holes has the unfolded paper?
A 6 **B** 10 **C** 16 **D** 20 **E** 32

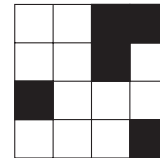
- B13.** Different figures represent different digits. Find the digit corresponding to the square.

$$\begin{array}{r}
 \square \\
 + \quad \square \\
 \hline
 \bigcirc \bigcirc \\
 \triangle \triangle \triangle
 \end{array}$$

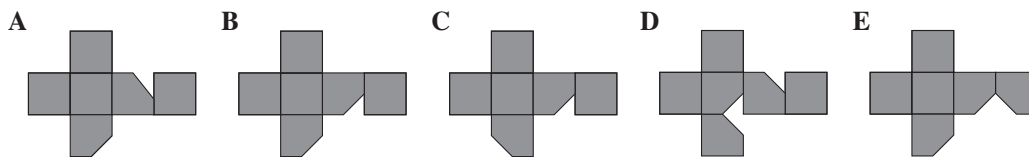
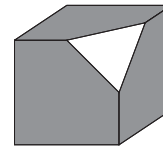
- A** 9 **B** 8 **C** 7 **D** 6 **E** 5
- B14.** The weight of 3 apples and 2 oranges is 255 g. The weight of 2 apples and 3 oranges is 285 g. Each apple has the same weight, and each orange has the same weight. What is the weight in grams of 1 apple and 1 orange together?
A 110 **B** 108 **C** 105 **D** 104 **E** 102
- B15.** The best mathematician in the 7th grade was asked to guess the positive integer about which his friends made the following statements:
 Thomas: "This number is 9."
 Ronald: "This number is prime."
 Andrew: "This number is even."
 Michael: "This number is 15."
 Ronald and Thomas together made one true statement, as well as Andrew and Michael. This number is:
A 1 **B** 2 **C** 3 **D** 9 **E** 15

B16. What is the smallest number of little squares that need to be painted to get at least one axis of symmetry in the picture?

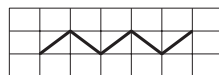
- A 1 B 2 C 3 D 4 E 5



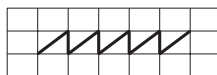
B17. We have cut off one corner of a cube. Which of the developments below is the development of the remaining part?



B18. Snail quadruplets have gone hiking on a path paved with identical rectangular tiles. The shape and length of each snail's trip is shown below.



Fin hiked 25 dm



Pin hiked 37 dm



Rin hiked 38 dm



Tin hiked ? dm

How many decimeters has the snail Tin hiked?

- A 27 B 30 C 35 D 36 E 40

B19. Turtle Island has an unusual weather system: on Mondays and Wednesdays it's always rainy, on Saturdays it's foggy, and the other days are sunny. A group of tourists would like to go on a 44-day-long holiday to the island. Which day of the week should be the first day of their holiday in order to enjoy the most sunny days?

- A Monday B Wednesday C Thursday D Friday E Tuesday

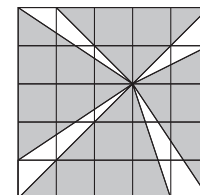
B20. The sum of two positive integers is equal to 77. If the first number is multiplied by 8 and the second by 6, the two products are equal. The larger of these numbers is

- A 23 B 33 C 43 D 44 E 54

5-POINT QUESTIONS

B21. In the diagram drawn on the square grid, find the ratio of the unshaded area to the shaded area.

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



B22. Ella and Emma went mushrooming. They found 70 mushrooms. $\frac{5}{9}$ of the mushrooms Ella found were boletuses, and $\frac{2}{17}$ of the mushrooms Emma has found were orange-caps. How many mushrooms did Ella find?

- A 27 B 36 C 45 D 54 E 10

B23. In the picture we have 11 fields.



In the first field there is a 7, and in the ninth field we have a 6. What positive integer has to be written in the second field for the following condition to be valid: the sum of any three adjoining fields is equal to 21?

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

B24. This is a multiplication table. Which two letters represent the same number?

- A** *L* and *M* **B** *P* and *N* **C** *R* and *S*
D *K* and *R* **E** *M* and *T*

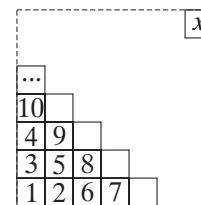
| | | | | |
|---|----------|----------|----------|----------|
| × | | | | 7 |
| | <i>J</i> | <i>K</i> | <i>L</i> | 56 |
| | <i>M</i> | 36 | 8 | <i>N</i> |
| | <i>P</i> | 27 | 6 | <i>R</i> |
| 6 | 18 | <i>S</i> | <i>T</i> | 42 |

B25. In a CD store two CD's have the same price. The first CD becomes 5% cheaper, and the other one increases 15% in price. Now the two prices differ by 6 euros. What is the price in euros of the cheaper CD now?

- A** 1.50 **B** 6 **C** 28.50 **D** 30 **E** 34.50

B26. You write a number in each square as shown in the square figure. Then, the number *x* cannot be:

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



B27. Bill divided $\underbrace{111\dots1}_{2004}$ by 3. The number of zeros in the quotient he obtained is equal to

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

B28. Imagine that you have 108 red balls and 180 green balls. You want to put all of them in bags, and there must be the same number of balls in each bag, and all the balls in each bag must be the same color. What is the minimum number of bags you need?

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

B29. In the Kangaroo summer camp a math competition was organized with 10 problems. Each correct answer was worth 5 points. For each incorrect answer 3 points were deducted. Everybody answered all the problems. Matt had 34 points, Zsolt had 10 points, and Gábor had 2 points. How many correct answers did they have altogether?

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

B30. A right triangle with legs of length 6 cm and 8 cm is cut out of a sheet of paper and then folded along a straight line. What can the area be, in cm^2 , of the resulting polygon?

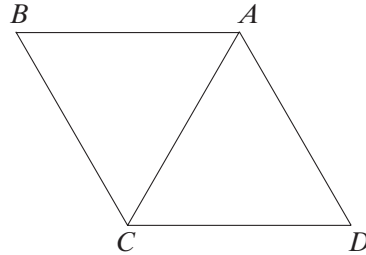
- A** 9 **B** 12 **C** 18 **D** 24 **E** 30

CADET (grades 7 and 8)

3-POINT QUESTIONS

- C1.** What is the value of $2004 - 200 \cdot 4$?
A 7216 **B** 0 **C** 1204 **D** 1200 **E** 2804

- C2.** An equilateral triangle ACD is rotated counterclockwise around point A . At what angle has it been rotated when it covers equilateral triangle ABC for the first time?
A 60° **B** 120° **C** 180° **D** 240° **E** 300°



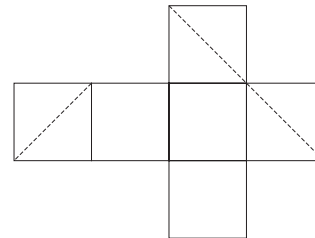
- C3.** We multiplied the number x by 0.5 and divided the product obtained by 3. By squaring the quotient and adding 1 we obtained 50. What is the number x equal to?
A 18 **B** 24 **C** 30 **D** 40 **E** 42

- C4.** Caroline wants to write the numbers 1, 2, 3, 4 in the square 4×4 in such a way that every row and every column has each of the numbers. You see how she started. How many of the 4 numbers can be written in place of x ?
A 1 **B** 2 **C** 3 **D** 4 **E** Impossible to determine

| | | | |
|---|---|-----|--|
| 1 | | x | |
| 4 | 1 | | |
| | 3 | | |
| | 2 | | |

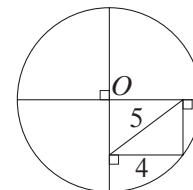
- C5.** The value of the expression $(1 - 2) - (3 - 4) - (5 - 6) - \dots - (99 - 100)$ is equal to
A -50 **B** 49 **C** -48 **D** 48 **E** 50

- C6.** The section of a cube by a plane generates a plane figure. I have plotted this section in the development of the cube (see the picture). Can you find out what figure it is?
A An equilateral triangle
B A rectangle, but not a square
C A right triangle
D A square
E A hexagon



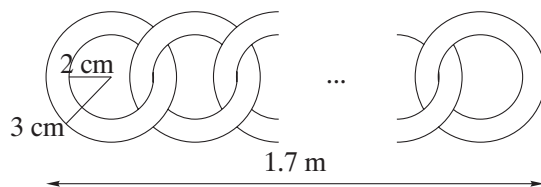
- C7.** We have a rectangle and decide to enlarge it by increasing both length and width by 10%. The percentage of increase in area is
A 10% **B** 20% **C** 21% **D** 100% **E** 121%

- C8.** The point O is the center of the circle in the picture. What is the diameter of the circle?
A 18 **B** 12 **C** 10 **D** 12.5 **E** 14



- C9.** An ice cream stand has five different flavors. A group of children comes to the stand, and each child buys a double scoop cone with two flavors of ice cream. If none of the children choose the same combination of flavors, and every different combination of flavors is chosen, how many children are there?
A 5 **B** 10 **C** 20 **D** 25 **E** 30

C10. We link rings together as shown in the figure below; the length of the chain is 1.7 m.



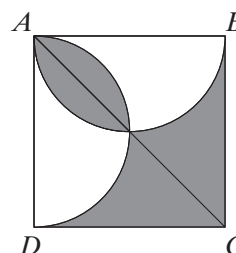
How many rings are there?

- A** 17 **B** 21 **C** 30 **D** 42 **E** 85

4-POINT QUESTIONS

C11. In the picture a square $ABCD$ and two semicircles with diameters AB and AD have been drawn. If $AB = 2$, what is the area of the shaded region?

- A** 4 **B** 8 **C** 8π **D** 2π **E** 3



C12. In the picture we have 11 fields.



In the first field there is a 7, and in the ninth field we have a 6. What positive integer has to be written in the second field for the following condition to be valid: the sum of any three adjoining fields is equal to 21?

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

C13. In the first year of two consecutive years there were more Thursdays than Tuesdays. Which day of the week was there more of in the second year, considering that neither of these years was a leap year?

- A** Tuesday **B** Wednesday **C** Friday **D** Saturday **E** Sunday

C14. ABC is an isosceles triangle with $AB = AC = 5$ cm and $\angle BAC > 60^\circ$. The length of its perimeter is a whole number of centimeters. How many such triangles are possible?

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

C15. Romeo the ostrich is training for the Head in the Sand Competition. He put his head into the sand at 8:15 on Monday morning and having been underground for 98 hours and 56 minutes reached a new personal record. When did Romeo pull his head out of the sand?

- A** On Thursday at 5:19 **B** On Thursday at 5:41 **C** On Thursday at 11:11
D On Friday at 5:19 **E** On Friday at 11:11

C16. Somebody has a large amount of building bricks $1 \times 2 \times 3$. What is the smallest number of bricks needed to build a cube?

- A** 12 **B** 18 **C** 24 **D** 36 **E** 60

C17. Each of five children thinks of a number, which can be either 1, 2, or 4. Their numbers are multiplied. Which number could be the result?

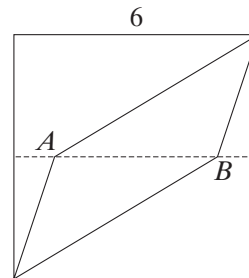
- A** 100 **B** 120 **C** 256 **D** 768 **E** 2048

C18. The average age of grandmother, grandfather, and 7 grandchildren is 28 years. The average age of 7 grandchildren is 15 years. Find the age of grandfather, if it is known that grandfather is 3 years older than grandmother.

- A** 71 **B** 72 **C** 73 **D** 74 **E** 75

- C19.** There were more than two kangaroos in the enclosure. One kangaroo said, “There are 6 of us here,” and jumped out of the enclosure. During each consecutive minute one kangaroo jumped out of the enclosure and said, “Everybody who jumped out before me was lying.” It continued until there were no kangaroos in the enclosure. How many kangaroos told the truth?
A 0 B 1 C 2 D 3 E 4

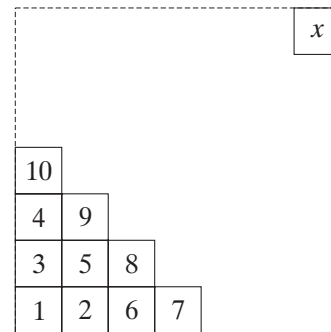
- C20.** In a square with sides of length 6 the points A and B are on a line joining the midpoints of the opposite sides of the square (see the figure). When you draw lines from A and B to two opposite vertices, you divide the square in three parts of equal area. What is the length of AB ?
A 3.6 B 3.8 C 4 D 4.2 E 4.4



5-POINT QUESTIONS

- C21.** A woman goes from a city to the beach at 30 km/h. On the return trip her speed is 10 km/h. What is her average speed for the whole trip?
A 12 B 15 C 20 D 22 E 25
- C22.** John decided to put some of his magazines on his bookshelf. They have either 48 or 52 pages. Which one of these numbers cannot be the total number of pages of the magazines on the bookshelf?
A 500 B 524 C 568 D 588 E 620

- C23.** You write a number in each square as shown in the square figure. Then, the number x cannot be:
A 128 B 256 C 81 D 121 E 400



- C24.** If a and b are positive integers, neither of which is divisible by 10, and if $ab = 10,000$, then the sum $a + b$ equals
A 1024 B 641 C 1258 D 2401 E 1000
- C25.** After one operation, the triplet (a, b, c) turns into triplet $(b + c, c + a, a + b)$. After 2004 successive operations, the triplet $(1, 3, 5)$ turned into a triplet (x, y, z) . What is the difference $x - y$ equal to?
A -2 B 2 C 4008 D 2004 E $(-2)^{2004}$

C26. This is a multiplication table. Which two letters represent the same number?

- A** L and M **B** P and N **C** R and S
D K and R **E** M and T

| | | | | |
|----------|-----|-----|-----|-----|
| \times | | | | 7 |
| | J | K | L | 56 |
| | M | 36 | 8 | N |
| | P | 27 | 6 | R |
| 6 | 18 | S | T | 42 |

- C27.** Some positive integers are written on the faces of a cube, and at each vertex we write the number equal to the product of the numbers on the three faces adjacent to that vertex. The sum of the numbers at the vertices is 70. Then the sum of the numbers on the faces is:
A 12 **B** 35 **C** 14 **D** 10 **E** Impossible to determine
- C28.** The number 2004 is divisible by 12, and the sum of its digits is equal to 6. Altogether, how many four-digit numbers have these two properties?
A 10 **B** 12 **C** 13 **D** 15 **E** 18
- C29.** A right triangle with legs of length 6 cm and 8 cm is cut out of a sheet of paper and then folded along a straight line. What can the area be, in cm^2 , of the resulting polygon?
A 9 **B** 12 **C** 18 **D** 24 **E** 30
- C30.** In the Kangaroo summer camp a math competition was organized with 10 problems. Each correct answer was worth 5 points. For each incorrect answer 3 points were deducted. Everybody answered all the problems. Matt had 34 points, Zsolt had 10 points, and Gábor had 2 points. How many correct answers did they have altogether?
A 17 **B** 18 **C** 15 **D** 13 **E** 21