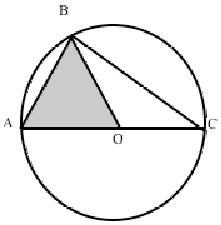
$\sqrt{3}$ ABC



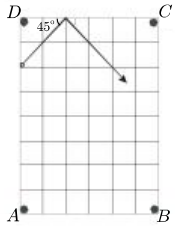
A) $2\sqrt{3}$ *B*) 2 *C*) 5 *D*) 4 *E*) $4\sqrt{3}$

$\frac{\eta\mu 1^0}{\sigma\upsilon\nu 89^0}$

A) 0 *B*) $\epsilon\varphi 1^0$ *C*) $\sigma\varphi 1^0$ *D*) $\frac{1}{89}$ *E*) 1

$45°$

;



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

2

$12\ m$

X $3\ m$

X;

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

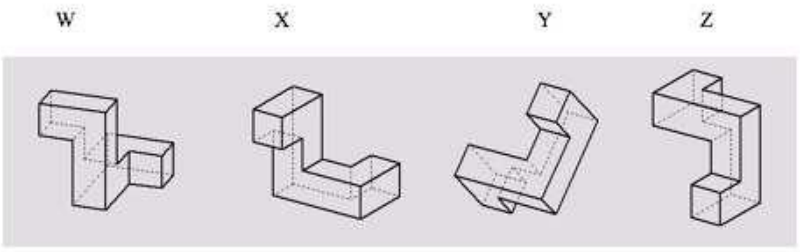
80% *Peter* 15

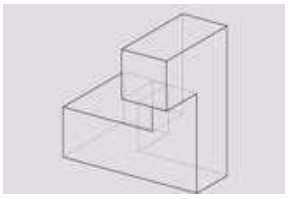
5 10

80% ;

A) 20 *B*) 25 *C*) 30 *D*) 35 *E*) 40

;

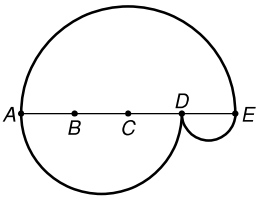




$A)$ W Y $B)$ X Z $C)$ Y $D)$ $E)$ W, X Y

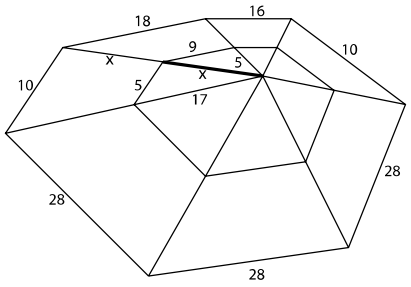
AE AE AD DE

A E



$A)$ $1:2$ $B)$ $2:3$ $C)$ $2:1$ $D)$ $3:2$ $E)$ $1:1$

x x



$A)$ $B)$ $C)$ $D)$ $E)$

$ABCD$ 1
$ABCD$

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

β 25% γ 50% α
γ
$A)$ 25% α
$B)$ 50% α
$C)$ 75% α
$D)$ 100% α
$E)$ 125% α

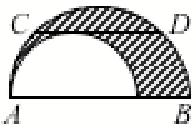
$2^{x+1} + 2^x = 3^{y+2} - 3^y$ x y x

$A)$ $B)$ $C)$ -1 $D)$ $E)$

$\sigma\upsilon\nu 1^0 + \sigma\upsilon\nu 2^0 + \sigma\upsilon\nu 3^0 + \ldots + \sigma\upsilon\nu 358^0 + \sigma\upsilon\nu 359^0$;

$A)$ 1 $B)$ π $C)$ 0 $D)$ 10 $E)$ -1

CD 4
AB



$A)$ π $B)$ $1,5\pi$ $C)$ 2π $D)$ 3π $E)$

$A)$ 4 $B)$ 8 $C)$ 9 $D)$ 11 $E)$

Thomas

;

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

A
B *A* *B*
;

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

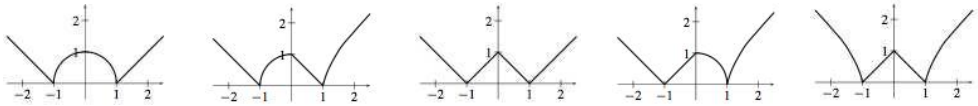
3

;

A) 30 *B*) 24 *C*) 12 *D*) 6 *E*) 3

$\sqrt{|(1+x)(1-|x|)|}$

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



$x+\sqrt{x}$ x

;

A) 870 *B*) 110 *C*) 90 *D*) 60 *E*) 30

$f(x)=\frac{2x}{3x+4}$ $f(g(x))=x$ $g(x)=$

A) $g(x)=\frac{3x+4}{2x}$ *B*) $g(x)=\frac{3x}{2x+4}$ *C*) $g(x)=\frac{2x+4}{4x}$ *D*) $g(x)=\frac{4x}{2-3x}$ *E*)

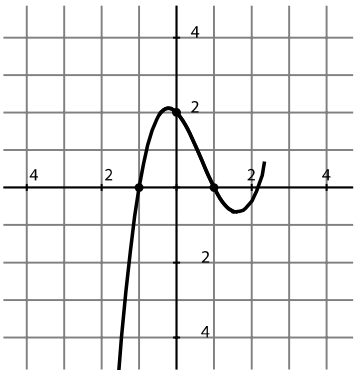
Ann *Belinda* *Charles* *Ann* 1 2 3 *Belinda* 4 5 *Charles* *Ann* *Belinda* *Charles* *Ann* *Charles*

A) $\frac{1}{6}$ *B)* $\frac{1}{8}$ *C)* $\frac{1}{11}$ *D)* $\frac{1}{13}$ *E)* *Charles*

;

A) 15^0 *B)* 30^0 *C)* 45^0 *D)* 60^0 *E)* 75^0

$f(x) = ax^3 + bx^2 + cx + d$ b;



A) -4 *B)* -2 *C)* *D)* *E)*

a

$x^2 + ax + 2007 = 0$

A) 3 *B)* 4 *C)* 6 *D)* 8 *E)*

$$\frac{1}{2\sqrt{1} + 1\sqrt{2}} + \frac{1}{3\sqrt{2} + 2\sqrt{3}} + \ldots + \frac{1}{100\sqrt{99} + 99\sqrt{100}}$$

A) $\frac{999}{1000}$ *B)* $\frac{99}{100}$ *C)* $\frac{9}{10}$ *D)* 9 *E)* 1

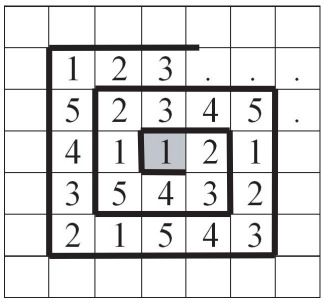
;

A) 5 *B*) 10 *C*) 44 *D*) 50 *E*) 120

123451234512345 . . .

100

;



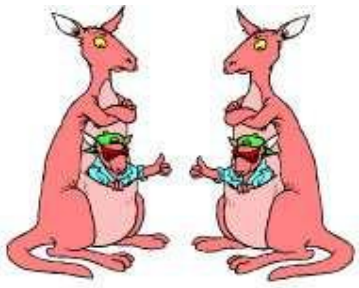
A) 1 *B*) 2 *C*) 3 *D*) 4 *E*) 5

$1, 3, 4, 9, 10, 12, 13, \ldots$ 3

3

100 ;

A) 150 *B*) 981 *C*) 1234 *D*) 2401 *E*) 3^{100}



Kangourou Mathematics 2008 Levels 5-6

3 points

1) Which is the smallest ?

A) 2 + 0 + 0 +8 B) 200/8 C) 2 x 0 x 0 x 8 D) 200 – 8 E) 8 + 0 + 0 - 2

2) By what can be replaced to have:

X = 2 X 2 X 3 X 3 ?

A) 2 B) 3 C) 2 X 3 D) 2 X 2 E) 3 X 3

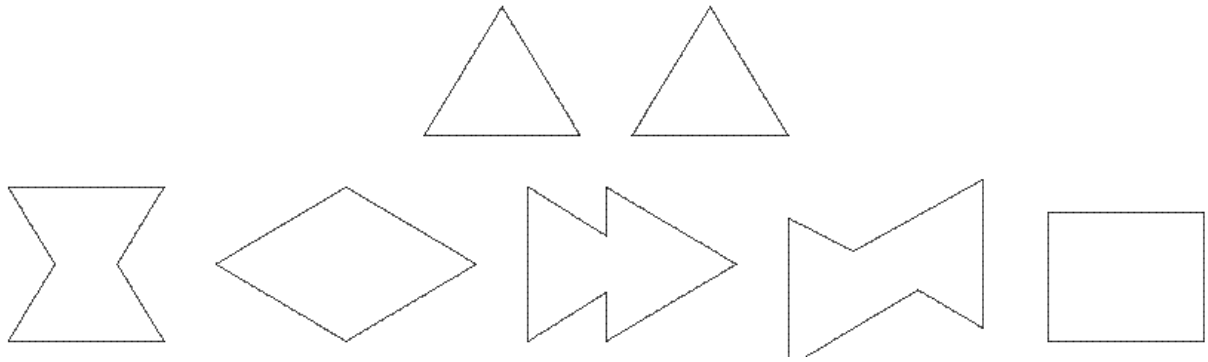
3) John(J) likes to multiply by 3, Pete(P) likes to add 2, and Nick(N) likes to subtract 1. In what order should they perform their favorite actions to convert 3 into 14?

A) JPN B) PJN C) JNP D) NJP E) PNJ

4) In a piece of paper there were written some number calculations, but a drop of ink made a stain and covered a number or an arithmetic symbol. Now we see the following: $1+1$ ■ $1-2=100$. What was at under the stain?

A) + B) – C) × D) 0 E) 1

5) Carol is playing with the two equilateral triangular cards shown. She puts one card besides or on top of a part of the other and both on a piece of paper. Then she draws on the paper around them, following the contour. Only one of the shapes she cannot get. Which one is it?

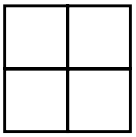


A) B) C) D) E)

Kangourou Mathematics 2008 Levels 5-6

6) Numbers 2, 3, 4 and one more number are written in the cells of 2 X 2 table. It is known that the sum of the numbers in the first row is equal to 9, and the sum of the numbers in the second row is equal to 6. The unknown number is

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



7) At a pirate school, each student had to sew a black and white flag. The condition was, that the black colour had to cover exactly three fifths of the flag. How many of the following flags fulfilled this condition?

A) None. B) One. C) Two. D) Three. E) Four.

8) Before the snowball fight, Paul had prepared a few snowballs. During the fight, he made another 17 snowballs and he threw 21 snowballs at the other boys. After the fight, he had 15 snowballs left. How many snowballs had Paul prepared before the fight?

A) 53 B) 33 C) 23 D) 19 E) 18

9) This is a small piece of the multiplication table.

×	4	3
5	20	15
7	28	21

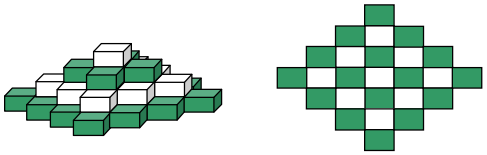
And this is an other one, in which, unfortunately, some numbers are missing.

×		
	35	63
	30	?

What is the number in the square with the question mark ?

A) 54 B) 56 C) 65 D) 36 E) 42

10) In a shop selling toys a four-floor black and white “brickflower” is displayed. (picture 1). Each floor is made of bricks of the same colour. On picture 2, the flower is shown from the top. How many white bricks were used to make the flower?



A) 9 B) 10 C) 12 D) 13 E) 14

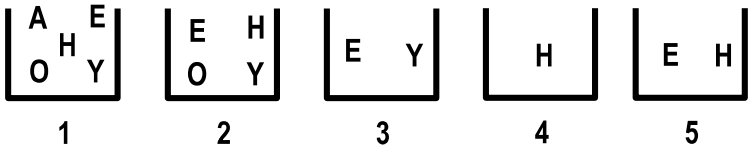
Kangourou Mathematics 2008 Levels 5-6

4 points

11) With what number of identical matches it is impossible to form a triangle? (The matches should not be broken!)

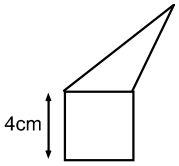
A) 7 B) 6 C) 5 D) 4 E) 3

12) There are 5 boxes and each box contains some cards labelled A, E, H, O, Y as shown. Peter wants to remove cards from each box in such a way that at the end each box contains only one card, and different boxes contain cards with different letters. What card remains in box 2?



A) A B) E C) H D) O E) Y

13) The triangle and the square have the same perimeter. What is the perimeter of the whole figure (a pentagon)?

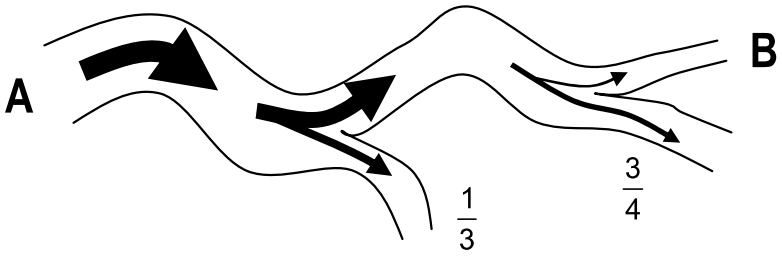


A) 12 cm B) 24 cm C) 28 cm D) 32 cm E) It depends of the triangle measures

14) A circular table is surrounded by 60 chairs. In some of the chairs there are people seating while the rest are empty. Between any two people who are seating there are two empty chairs. How many people are seating around the table?

A) 19 B) 20 C) 21 D) 29 E) 30

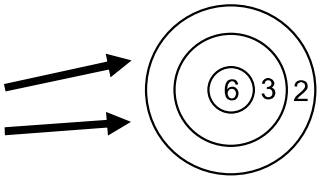
15) A river starts at point A. As it flows the river splits in two. One branch takes 1/3 of the water and the second takes the rest. Later the second branch splits in two, one taking 3/4 of the branch's water, the other the rest. The map below shows the situation. What proportion of the original water flows at the point B?



A) $\frac{1}{4}$ B) $\frac{2}{3}$ C) $\frac{11}{12}$ D) $\frac{1}{6}$ E) we cannot compute it.

Kangourou Mathematics 2008 Levels 5-6

16) By shooting two arrows at the shown aiming board on the wall, how many different scores can we obtained? (Missing the board is possible.)

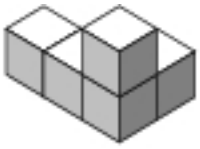


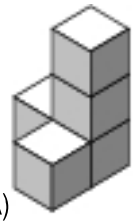
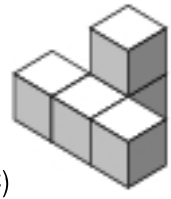
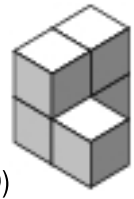
A) 4 B) 6 C) 8
D) 9 E) 10

17) Rebeka was sorting her books. The one third of her books did not fit on the shelves of her bookcase, so she put them in three drawers. In each drawer she managed to put 7 books, so again there did not fit and two books were left, which she left on the table. How many books does Rebeka have?

A) 21 B) 23 C) 27 D) 63 E) 69

18) Which of the "buildings" (A),..., (E) – each consisting of exactly 5 cubes – can you *not* obtain from the building on the right hand side if you are allowed only to move exactly one cube?



A)  B)  C)  D)  E) 

19) Points *A*, *B*, *C* and *D* are marked on the straight line in some order. It is known that *AB* = 13, *BC* = 11, *CD* = 14 and *DA* = 12. What is the distance between the farthest two points?

A) 14 B) 38 C) 50 D) 25 E) another answer

20) Today I can say: Two years later my son will be twice as old as he was two years ago. And three years later my daughter will be three times as old as she was three years ago. What's right?

A) The son is one year older than the daughter
B) The daughter is one year older than the son
C) They are of equal age
D) The son is two years older than the daughter
E) The daughter is two years older than the son

Kangourou Mathematics 2008 Levels 5-6

5 points

21) The five signs @, *, #, &, ^ represent five different digits from which none is zero. They are connected through the following calculations:

@ + @ + @ = *
# + # + # = &
* + & = ^
^ = ?
What is the digit ^ ?

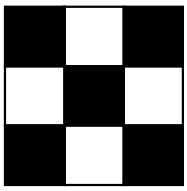
A) 3 B) 2 C) 6 D) 8 E) 9

22) In new year's day Vasile received for a gift a t-shirt, which had the number 2008 printed on the front. Then he went in front of a mirror and balanced up-side down with his hands on the ground and his feet up. What did his friend Nike could read through the mirror who was standing normally next to Vasile?

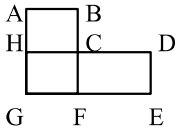
A) 2008 B) 5008 C) 8002 D) 8005 E) 2005

23) Suppose you make a journey over the squared board shown, and you visit every square exactly once. Where must you start, if you can move only horizontally or vertically, but not diagonally?

A) In the middle square
B) At a corner square
C) At an unshaded square
D) At a shaded square
E) You can start at any square

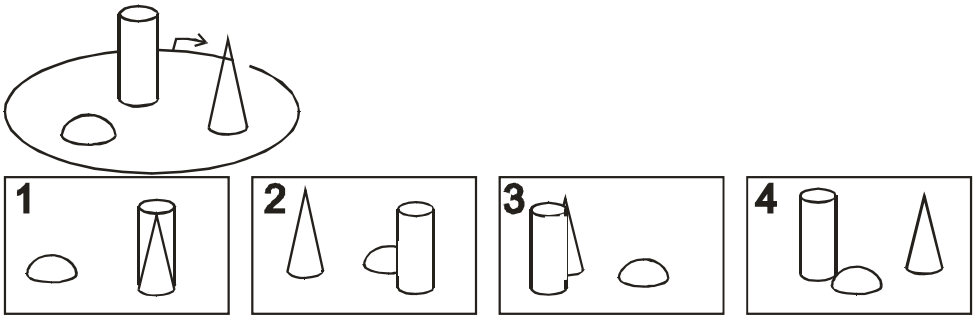


24) The picture shows the plan of a town. There are four circular bus routes in the town. №1 bus follows the route C-D-E-F-G-H-C, which is 17km long. №2 bus goes A-B-C-F-G-H-A, and covers 12 km. The route of №3 bus is A-B-C-D-E-F-G-H-A, and is equal to 20 km. №4 bus travels C-F-G-H-C. How long is this route?



A) 5 km B) 8 km C) 9 km D) 12 km E) 15 km

25) Betty walked once around the park, starting from the marked point in direction of the arrow. She made 4 photos. In which order did she make the photos?



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

26) Seven cards lie in a box. Numbers from 1 to 7 are written on these cards (exactly one number on the card). The first sage takes, at random, 3 cards from the box and the second sage takes 2 cards (2 cards are left in the box). Then the first sage tells the second one: "I know that the sum of the numbers of your cards is even". The sum of card's numbers of the first sage is equal to

A) 10 B) 12 C) 6 D) 9 E) 15

27) Maria has drawn a picture on a piece of paper with dimensions 80cmX160cm . Afterwards she transferred the picture onto a smaller paper with dimensions 30cmX40cm. The longer side of the first picture fits exactly the longer side of the smaller. What area of the 30cmX40cm remained uncovered?

Paper 80 cm x 160 cm

Paper 30 cm x 40 cm

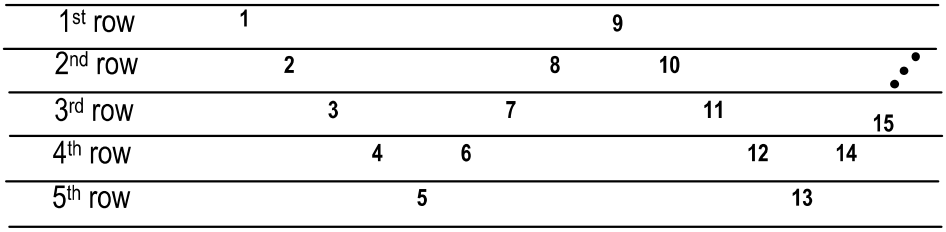
A) 300 cm^2 B) 400 cm^2 C) 500 cm^2 D) 600 cm^2 E) 800 cm^2

28) How many three digit numbers are there, whose written form contains exactly two consecutive digits 3 ?

A) 16 B) 17 CГ) 18 D) 19 E) 20

29)

We write consecutively the numbers 1, 2, 3, 4, 5, ... with the following zink-zank method.
In which row the number 800 is located?



A) 1st row B) 2nd row C) 3rd row D) 4th row E) 5th row

30) How many digits can at most be erased from the 1000-digit number 20082008…2008 (continuous repetition of 2008), such that the sum of the remaining digits is 2008?

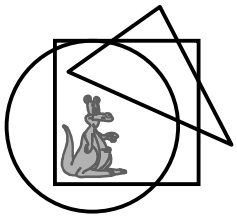
A) 260 B) 510 C) 746 D) 1020 E) 130

3 Points Questions:

1) Among these numbers, which one is even?

(A) 2009 **(B)** 2 + 0 + 0 + 9 **(C)** 200 − 9
(D) 200 × 9 **(E)** 200 + 9

2) Where is the kangourou?

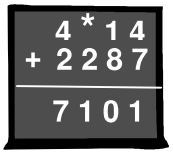


(A) In the circle and in the triangle, but outside the square.
(B) In the circle and in the square, but outside the triangle.
(C) In the triangle and in the square, but outside the circle.
(D) In the circle, but outside the square and outside the triangle.
(E) In the square, but outside the circle and outside the triangle.

3) How many integers are there between 19, 03 and 2,009?

(A) 16 **(B)** 17 **(C)** 14 **(D)** 15 **(E)** more than 17

4) On the board there was an addition of numbers written but one digit was erased as shown. Which digit is the missing one?

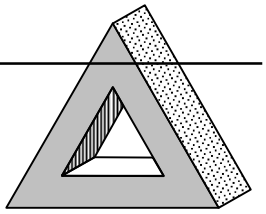


A) 2 **B)** 4 **C)** 5 **D)** 7 **E)** 8

5. Anna has three boxes: white, red and green. One of them contains a bar of chocolate, the second contains an apple, and the third is empty. In which box we can find the chocolate, if it is known, that the chocolate is either in the white or in the red box, and the apple is neither in the white no in the green box.

(A) white **(B)** red **(C)** green
(D) red or green **(E)** impossible to determine

6) How many sides does this solid have (a prism with a hole)?

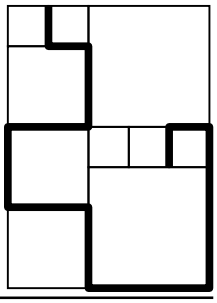


A) 3 **B)** 5 **C)** 6 **D)** 8 **E)** 12

7. A bridge is built across the river. The river is 120 meters wide. One quarter of the bridge is over the left river bank and one quarter of the bridge is over the right river bank. How long is the bridge?

(A) 150 m **(B)** 180 m **(C)** 210 m **(D)** 240 m **(E)** 270 m

8. There are squares of three different sizes at the picture. The side of the smallest one is 2 metres long. What is the length of the dark marked bent line?



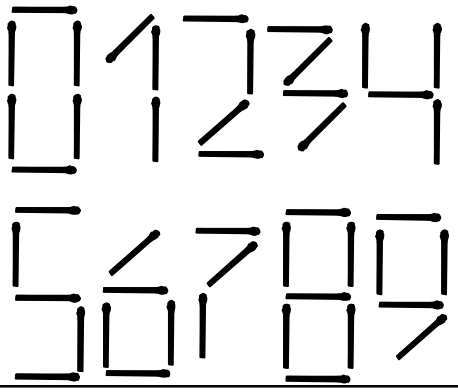
(A) 38 m **(B)** 40 m **(C)** 42 m **(D)** 44 m **(E)** 168 m

9. There are cats and dogs in the room. The number of cats' paws is twice the number of dogs' noses. Then the number of cats is

(A) twice the number of dogs
(B) equal to the number of dogs
(C) half the number of dogs
(D) $\frac{1}{4}$ of the number of dogs
(E) four times the number of dogs

---

10) A kid used matches sticks to form the numbers 0 to 9, as shown in the figure. How many sticks are needed in order to form the two digit number that requires the largest number of sticks?

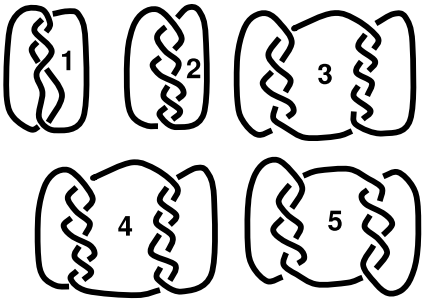


A) 10 sticks
B) 11 sticks
C) 12 sticks
D) 13 sticks
E) 14 sticks

---

4 points questions:

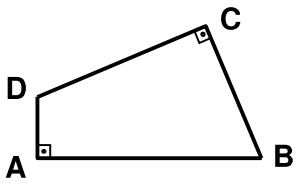
11) Which of the following links requires more than one piece of rope to construct?



A) 1, 3, 4 and 5
B) 3, 4 and 5
C) 1, 3 and 5
D) all
E) none of them

---

12) The quadrilateral ABCD has sides $AB = 11$ m, $B\Gamma = 7$ m, $\Gamma\Delta = 9$ m and $\Delta A = 3$ m. The angles A and C are 90°. What is the area of the quadrilateral?



A) 30 sq m
B) 44 sq m
C) 48 sq m
D) 52 sq m
E) 60 sq m

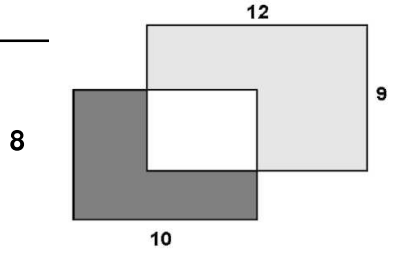
---

13) There are 39 green and 23 yellow birds on a tree. Every one hour 6 new green birds and 8 yellow new birds are coming to the tree. After some hours there will an equal number of green and yellow birds on the tree. How many birds in total (green and yellow) there will be at this time?

A) 144
B) 154
C) 164
D) 174
E) 184

---

14) Two rectangles of 8 X 10 and 9 X 12 partly cover each other. The dark grey area is 37. What is the light grey area?



(A) 60
(B) 62
(C) 62, 5
(D) 64
(E) 65

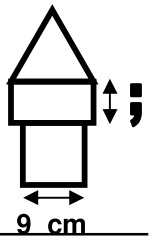
---

15) The number 12323314 is written on the board. John wants to erase some of the digits so that the new number that will come up will be read the same either from left to right or from right to left. What is the smallest possible number of digits that he should erase?

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

---

16) Keith had drown a Tower as shown on the figure. The Tower consists of three pieces, a square, a rectangle and an equilateral triangle. The three pieces have the same perimeter. If the side of the square is 9 cm, what is the length of the marked side of the rectangle?



A) 4 cm **B)** 5 cm **C)** 6 cm **D)** 7 cm **E)** 8 cm

17) Kostas has a box of dimensions 30 cm length, 30 cm width and 50 cm height. He wants to fill it up with cubes that have the same size. The cubes of Kostas have side an integer number of cm. What is the minimum number of cubes that he can use?

A) 15 **B)** 30 **C)** 45 **D)** 75 **E)** 150

18) Today is Sunday. Francis begins to read a book with 290 pages. He reads 4 pages each day, except on Sundays, when he always read 25 pages, without jumping any day. How many days it took him to read the book?

A) 5 **B)** 46 **C)** 40 **D)** 35 **E)** 41

19) Andreas, Vasilis, Yiannis and Demetris have books in their bags. One of them has one book in his bag, another one has two, another has three and the last one has four books in his bag. Andreas, Vasilis and Demetris have together 6 books. Vasilis and Yiannis together have 6 books. Vasilis has in his bag less books than Andreas. Who is the one that has only one book in his bag;

A) Andreas **B)** Vasilis **C)** Yiannis **D)** Demetris
E) we cannot find it

20) Helen has 18 equally sized squares. She places them side by side in order to form full rectangles. How many different rectangles can show form?

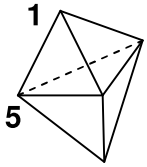
A) 1 **B)** 2 **C)** 3 **D)** 5 **E)** 10

5 points questions:

21) Makis has in mind an integer number A (not zero). He said 4 statements for A:
α) It is multiple of 3. β) It is multiple of 4.
C) It is multiple of 12. D) It is less than 4.
If it is known that from these statements exactly two are true and the other two are false, then A is equal to:

A) 1 **B)** 3 **C)** 4 **D)** 6 **E)** 12

22) The picture shows a solid formed with 6 triangular faces. At each vertex there is a number. For each face we consider the sum of the 3 numbers at the vertices of that face. If all the sums are the same and two of the numbers are 1 and 5 as shown, what is the sum of all the 5 numbers?

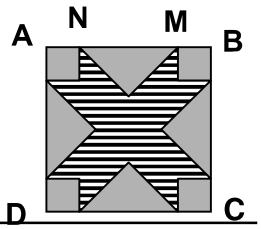


A) 9 **B)** 12 **C)** 17 **D)** 18 **E)** 24

23) A hotel has 5 floors and each floor has 35 rooms. The rooms of the first floor are numbered from 101 to 135. At the second floor they are numbered from 201 to 235, at the third 301 to 335, at the fourth from 401 to 435 and at the fifth from 501 to 535. How many times will the digit 2 be used to number the rooms?

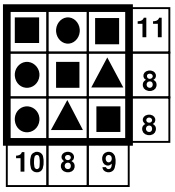
A) 60 **B)** 65 **C)** 95 **D)** 100 **E)** 105

24) ABCD is a square with side 10. The distance between N and M is 6. Each shape of the shaded part is either a square or an isosceles right triangle. Find the area of the line shaded region.



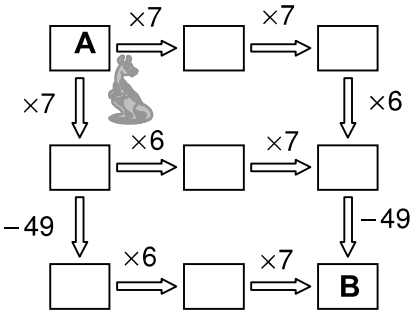
A) 42 **B)** 46
C) 48 **D)** 52
E) 58

25) In the figure the symbols ■ ▲ ● represent numbers. The sum of the digits in each row and in each column is written on the figure. What is the value of the number ■ + ▲ − ● ;



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

26) Kangaroo thinks an integer number and places it in box A. Then follows one of the possible paths indicated by arrows and perform the corresponding operations. Can Kangaroo obtain the number 2009 when arriving to the box B?



(A) Yes, going for the three possible paths

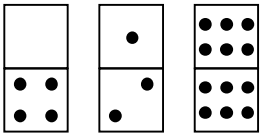
(B) Yes, going for two of the paths, and beginning with the same number in both paths

(C) Yes, going for two of the paths, and beginning with different number in both paths

(D) Yes, only going for one of the possible path

(E) No, it's not possible

27) A complete set of 28 dominoes contains every possible combination of two numbers of dots between 0 and 6 included, including twice the same number. How many dots are there all together on a set of dominoes?



A) 84 **B)** 105 **C)** 126 **D)** 147 **E)** 168

28) In a 4 x 2 table, two numbers are written in the first row. Each next row contains the sum and the difference of the numbers written in the previous row (see the picture for an example). In a table 7 x 2, filled in the same way, the numbers of the last row are 94 and 64. What is the sum of the numbers in the first row of the 7 x 2 table?

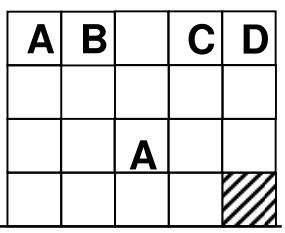
10	3
13	7
20	6
26	14

A) 8 **B)** 10 **C)** 12 **D)** 20 **E)** 24

29) A clock is quite strange. Firstly, it has only one hand. Every minute the hand jumps and moves five numbers further. In some occasion it was showing 12. One minute later the hand jumped to the number 5. After another one minute it jumped to 10 and so on. After how many minutes, since it was showing 12, it will show 12 again for the first time.

A) never **B)** 4 minutes **C)** 6 minutes **D)** 8 minutes **E)** 12 minutes

30) We want to colour the squares in the grid using colours *A*, *B*, *C* and D in such a way that neighbouring squares do not have the same colour (squares that share a vertex are considered neighbours). Some of the squares have been coloured as shown. What are the possibilities for the shaded square?



A) A **B)** B **C)** C **D)** D **E)** there are two different possibilities

MATHEMATICS

LEVEL: 5 – 6
(Ε΄- Στ΄ Δημοτικού)

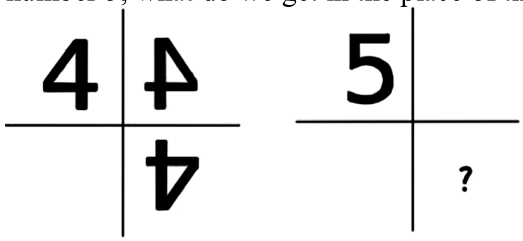
10:00 – 11:00 , 20 March 2010

3 points

1. Knowing that ▲ + ▲ + 6 = ▲ + ▲ + ▲ + ▲, which number is represented by ▲?

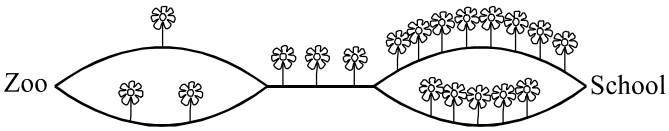
A) 2 B) 3 C) 4 D) 5 E) 6.

2. The number 4 is next to two mirrors so it reflects twice as shown. When the same thing happens to number 5, what do we get in the place of the question mark?



A) B) C) D) E)

3. Small Kangaroo goes directly from Zoo to School. He counts each flower on the way. Which of the following number cannot be his result?

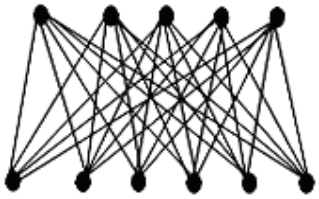


A) 9 B) 10 C) 11 D) 12 E) 13

4. A ladder has 21 stair steps. Nick and Mike are counting steps but one from bottom to top and the other from top to bottom. They meet on a stair step that Nick called the 10^{th} . What number will Mike give to the same stair step?

A) 13 B) 14 C) 11 D) 12 E) 10

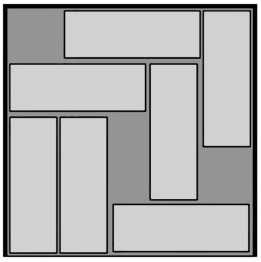
5. Ann has connected all the upper points to all the lower points. How many lines Ann has drawn?



A) 20 B) 25 C) 30 D) 35 E) 40

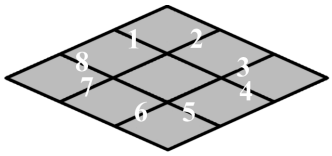
6. A fly has 6 legs, while a spider has 8 legs. Together, 2 flies and 3 spiders have as many legs as 10 birds and …

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

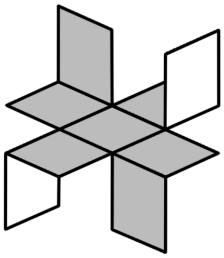


7. There are seven bars in the box. It is possible to slide the bars in the box so there will be room for one more bar. At least how many bars have to be moved?

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

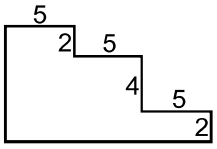


8. A square sheet of paper has a grey in the upper side and white in the lower side. Ann has divided it in nine little squares with numbers in each vertical line segment. Along which line segments does she have to cut the paper in order to form the second picture?



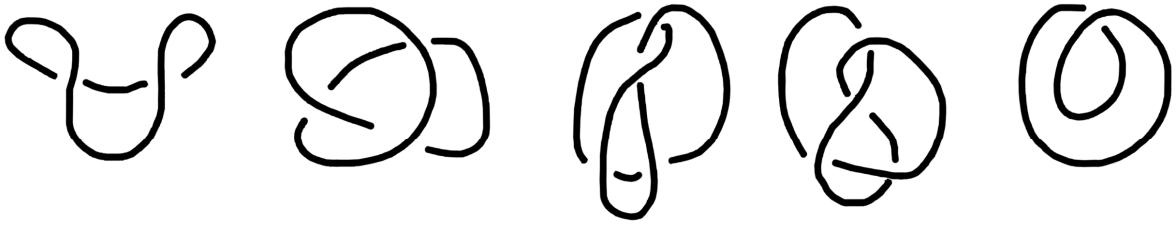
A) 1, 3, 5 and 7 B) 2, 4, 6 and 8 C) 2, 3, 5 and 6
D) 3, 4, 6 and 7 E) 1, 4, 5 and 8

9. What is the perimeter of the figure to the right (whose angles are all right angles)?



A) 3×5 + 4×2 B) 3×5 + 8×2 C) 6×5 + 4×2 D) 6×5 + 6×2 E) 6×5 + 8×2

10. The following figure shows five projections of knots. Actually only one of them is really a knot, all the others just seem to be one. Which one is the knot?



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

4 points

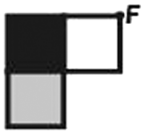
11. Which of the following expressions has a different value?

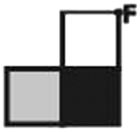
A) $20 \times 10 + 20 \times 10$ B) $20 \div 10 \times 20 \times 10$ C) $20 \times 10 \times 20 \div 10$
D) $20 \times 10 + 10 \times 20$ E) $20 \div 10 \times 20 + 10$

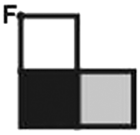
12. If the figure is rotated half circular turn around *F*, the result is:

A) 

B) 

C) 

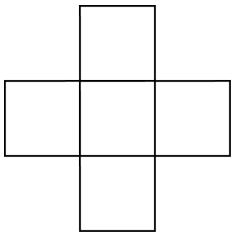
D) 

E) 

13. Ben has selected a number, has divided it by 7, then added 7 and finally multiplied the sum by 7. That way he comes up with the number 777. Which number did he select?

A) 7 B) 111 C) 722 D) 567 E) 728

14. The numbers 1, 4, 7, 10 and 13 have to be written in the picture so that the sum of three numbers in a row equal to the sum of the three numbers in a column. What is the biggest possible sum?



A) 18 B) 20 C) 21 D) 22 E) 24

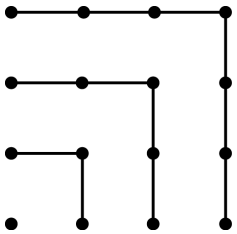
15. To make a newspaper with 60 pages you need 15 sheets of paper which are on top of each other. Then they are folded together. Page 7 is missing. Which other pages are missing in this newspaper?

A) 8, 9 and 10 B) 8, 42 and 43 C) 8, 48 and 49 D) 8, 52 and 53 E) 8, 53 and 54

16. By what can be replaced to have:

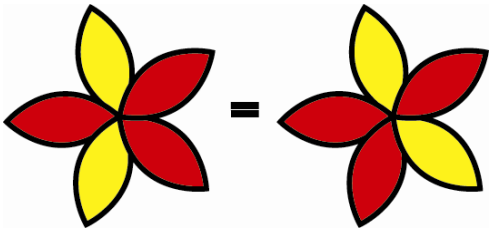
X = 2 X 2 X 3 X 3 ?

A) 2 B) 3 C) 2 X 3 D) 2 X 2 E) 3 X 3



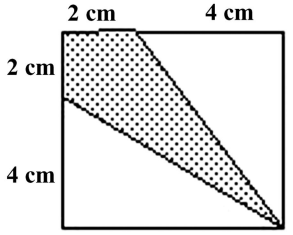
17. Using the picture to the right we can observe that 1+3+5+7 = 4 x 4. What is the value of 1 + 3 + 5 + 7 + … + 17 + 19 + 21?

A) 10 x 10 B) 11 x 11 C) 12 x 12 D) 13 x 13 E) 14 x 14



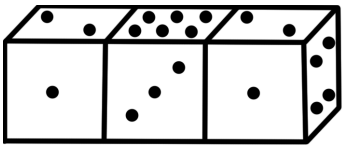
18. Ivona has drawn a flower with 5 petals. She wants to colour the flower, but she has only 2 different colours – white and black. How many different flowers can Ivona draw if she has to colour each petal using one of these 2 colours?

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



19. What fraction of the square is the shaded region?

A) $\frac{1}{3}$ B) $\frac{1}{4}$ C) $\frac{1}{5}$ D) $\frac{3}{8}$ E) $\frac{2}{9}$

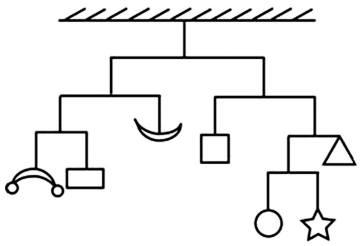


20. Three identical dice are glued together. See picture. The sum of dots on opposite sides of a dice is always 7. What is the sum of dots on the sides which are glued together?

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

5 points

21. The picture shows a balanced mobile. We neglect weights of horizontal bars and vertical strings. The total weight is 112 grams. What is the weight of the star?



A) 6 B) 7 C) 12 D) 16 E) We can't know

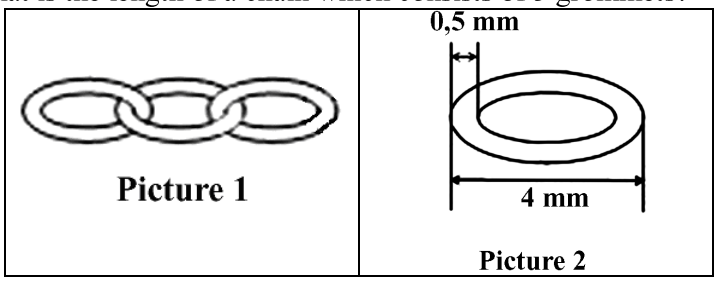
22. A pizza-shop offers a basic version of pizza with mozzarella and tomatoes. One or two toppings must be added: anchovies, artichokes, mushrooms, capers. Moreover, for each pizza three different sizes are available: small, medium, large. How many different types of pizza are available ?

A) 30 B) 12 C) 18 D) 48 E) 72

23. To decide who will have the last piece of Leni's birthday cake Leni, Sarah, Hannes, Petra and Arno stand in a circular form clockwise in order of their names above. They count clockwise: KAN-GA-ROO-OUT-GOES-YOU – each syllable counts one child and the one who is caught by the YOU is out of the game. They repeat until there is only one child left. Leni can choose who starts. Who will she pick to start in order to secure that the last piece of cake stays for her best friend Arno?

A) Leni B) Sarah C) Hannes D) Petra E) Arno

24. A jeweller makes chains by connecting identical grommets (picture 1). Proportions of grommets are shown on picture 2. What is the length of a chain which consists of 5 grommets?

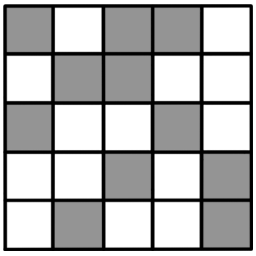


A) 20 mm B) 19 mm C) 17,5 mm D) 16 mm E) 15 mm

25. If in the multiplication $\overline{PPQ}\cdot Q=\overline{RQ5Q}$ the letters P, Q and R are different.
$P+Q+R=$

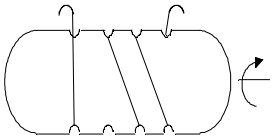
A) 13 B) 15 C) 16 D) 17 E) 20

26. What is the number of black cells in the figure that should be re-coloured white in order for any row and any column to contain exactly one black cell?



A) 4 B) 5 C) 6 D) 7 E) this can't be done.

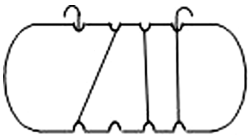
27. Andrea has wound some rope around a piece of wood. She rotates the wood as shown with the arrow.

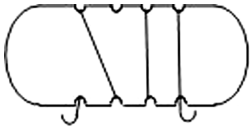


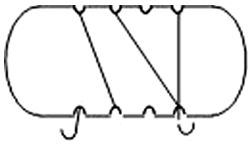
Front side

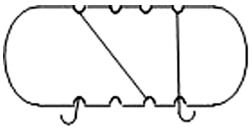
What is the correct back side of the piece of wood?

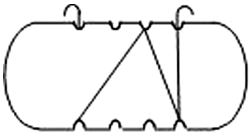
Back side:

A) 

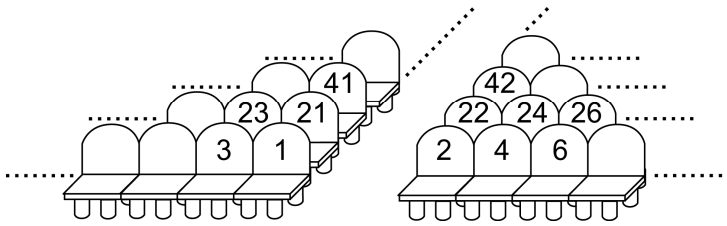
B) 

C) 

D) 

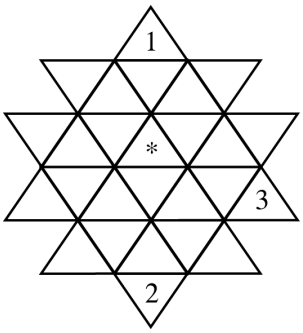
E) 

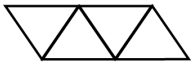
28. Ana bought a ticket with seat number 100. Bea wants to sit as close to her as possible. Only 5 tickets are available: 76, 94, 99, 104 and 118. Which one is the best?



A) 64 B) 76 C) 99 D) 104 E) 118

29. All triangles must be filled using the numbers 1, 2, 3, 4. Each time a piece of the form indicated on the right picture placed on four triangles, it hides 4 different numbers. (The piece can turn around, and hence it can be placed in any position). Some numbers have already been written. What number should be written in the place of *?





A) only 1 B) only 2 C) only 3 D) only 4 E) any of 1, 2 or 3

30. Six-, seven- and eight-legged octopus serve the underwater king. Those who have got 7 legs always lie, but those with 6 or 8 legs, always tell the truth. One day four octopuses met. The blue one said: «Altogether we've got 28 legs», the green one said: «Altogether we've got 27 legs», the yellow one said: «Altogether we've got 26 legs», the red one said: «Altogether we've got 25 legs». What's the colour of the octopus telling the truth?

A) red B) blue C) green D) yellow E) no one

MATHEMATICS

LEVEL 5 – 6
(Ε΄- ΣΤ΄ Δημοτικού)

19 March 2011
10:00-11:15

3 point

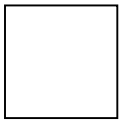
1. Basil writes the word KANGAROO, one letter each day.He starts on Wednesday. What will be the day when he finishes?

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

2. A motorcyclist rode a distance of 28 km in 30 minutes. At what average speed (km/h) did he drive?

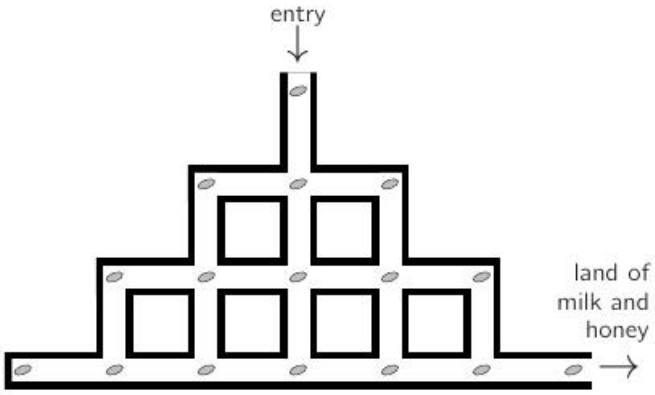
(A)28 (B)36 (C)56 (D)58 (E)62

3. A square of paper is cut into two pieces using a straight line.Which of the following shapes cannot be the result of the cut?



(A)a square (B)a rectangle (C)a right-angled triangle (D)a pentagon (E)an isosceles triangle

4. Hamster Fridolin sets out for the Land of Milk and Honey. His way to the legendary Landpasses through a system of tunnels. There are 16 pumpkin seeds throughout the tunnels, as shown in the picture. What is the highest number of pumkin seeds he can collect if he is not allowed to take the same path or intersection twice?

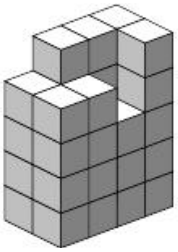


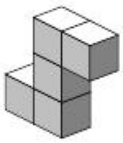
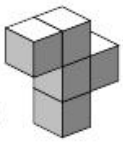
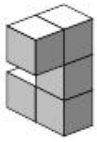
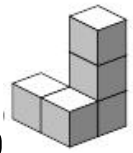
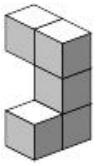
(A)12 (B)13 (C)14 (D)15 (E)16

5. In Crazytown, the houses on the right side of Number Street have odd numbers. However, Crazytowners don't use numbers containing the digit 3. The first house on the right side of the street is numbered 1. What is the number of the fifteenth house on the right side of the street?

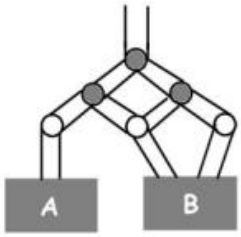
(A)29 (B)41 (C)43 (D)45 (E)47

6. Which of the following pieces do I need to complete the cuboid?



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

7. We pour 1000 litres of water into the top of the pipe. At every fork, the water splits into two equal parts. How many litres of water will reach container B?

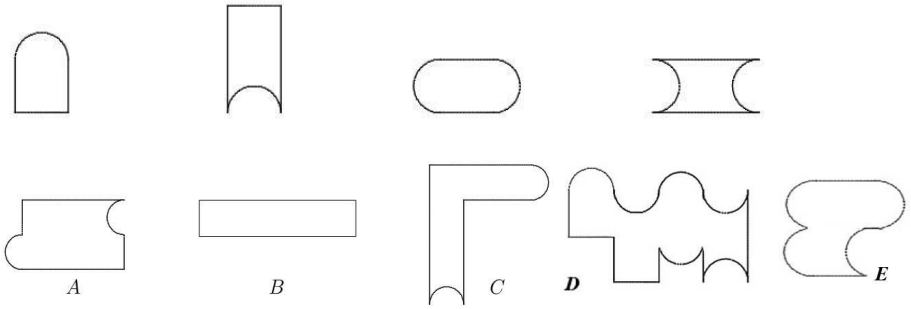


(A)800 (B)750 (C)666,67 (D)660 (E)500

8. The date 01-03-05 (1 March 2005) consists of three consecutive odd numbers in increasing order. This is the first date with this feature in the 21st century. Including the date given as an example, how many dates expressed in the form dd-mm-yy have this feature in the 21st century?

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

9. Four cardboard pieces are arranged to form a figure. Which of the five figures below is impossible to make?



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

10. If Liza the cat only laze around during the day, she drinks 60 ml of milk. If she catches mice, she drinks a third more milk. In the last two weeks she has been catching mice every other day. How much milk did she drink in the last two weeks?

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

4 point

11. Andrew wrote the letters of the word KANGAROO in cells, one letter per cell. He can write the first letter in any cell he wants. He writes every subsequent letter in a cell that has at least one point in common with the cell in which the letter before it was written. Which of the tables below cannot be Andrew's?

(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

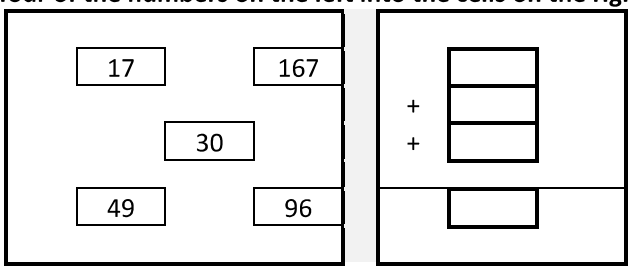
(E)

K	O
A	O
R	N
A	G

12. All 4-digit integers with the same digits as the number 2011 (two 1's, 0, and 2) are written in increasing order. What is the difference between the two neighbours of the number 2011 on this list?

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

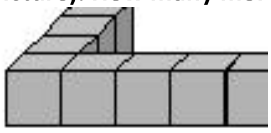
13. Move four of the numbers on the left into the cells on the right so that the addition is correct.



Which number remains on the left?

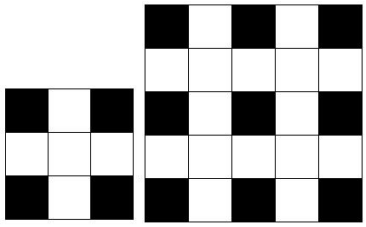
(A)17 (B)30 (C)49 (D)96 (E)167

14. Nina used 36 identical cubes to build a fence of cubes around a square region (part of it is shown in the picture). How many more cubes will she need to fill the region?



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

15. Square floors are made of white and black tiles. Floors with 4 and 9 black tiles are shown in the picture. There is a black tile in each corner and all tiles around a black tile are white. How many white tiles are needed for a floor with 25 black tiles?



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

16. Paul wanted to multiply an integer with 301, but he forgot the zero and multiplied it by 31 instead.The result he got was 372. What result was he supposed to get, if he did not make the mistake?

(A)3010 (B)3612 (C)3702 (D)3720 (E)30 720

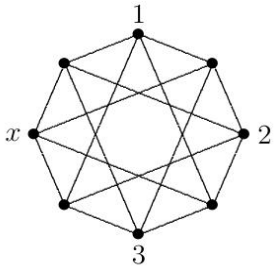
17. In a tournament FC Barcelona scored three goals and had one goal scored against it. It won one game, drew one game and lost one game. What was the score of the game FC Barcelona won?

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

18. We are given three points that form a triangle. We want to add one point to make a parallelogram. How many possibilities are there for the fourth point?

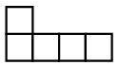
(A)1 (B)2 (C)3 (D)4 (E)It depends on the initial triangle

19. The numbers 1, 2, 3 or 4 should be written at each of the 8 marked points in the picture in such a way that the ends of each line segment should have different numbers. Three numbers have already been written as shown. X could be any one of the four numbers. How many times does 4 appear in the picture?



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

20. Daniel wants to make a complete square using only pieces like the one in the picture. What is the smallest number of pieces he can use?



(A)8 (B)10 (C)12 (D)16 (E)20

5 point

21. There are 10 pupils in a dance class. Their teacher has 80 jelly beans. If she gives each of the girls in her class the same number of jelly beans, there will be 3 jelly beans left over. How many boys are there in the class?

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

22. A cat has 7 kittens: white, black, red, white-black, white-red, black-red, and white-black-red. How many ways are there to choose 4 kittens so that any two among them have a common color?

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