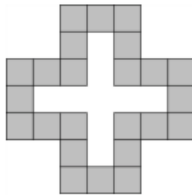


## Level 1

- There are twelve books on a shelf and four children in a room. How many books will be left on the shelf if each child takes one book?  
(A) 12       (B) 8      (C) 4      (D) 2      (E) 0
- Several students want to plant 20 tulips in the school garden. It takes ten minutes for them to plant five tulips. They started at 9:00 in the morning. At what time will they finish planting all 20 tulips?  
(A) At 9:10      (B) At 9:20       (C) At 9:40      (D) At 9:50  
(E) At 10:00
- There is a house on each corner of the streets. The houses are shown on the map. Two new houses will be built on each street between the corner houses. How many houses will there be in all?



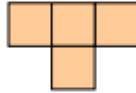
- (A) 8       (B) 12      (C) 16      (D) 20      (E) Other answer
- There is a path with square tiles.



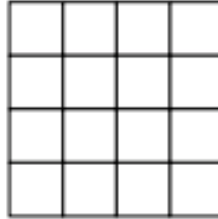
How many tiles fit in the area inside?

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

5. Ann has a lot of these pieces:



She tries to put them in the square, as many as possible. How many cells shall be left empty?



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

6. A square box is filled with two layers of identical square pieces of chocolate. Kirill has eaten all 20 pieces in the upper layer, which are along the walls of the box. How many pieces of chocolate are left in the box?

- (A) 16      (B) 30      (C) 50      (D) 52      (E) 70

Level 2

1. Aline writes a correct calculation. Then she covers two digits which are the same with a sticker:

$$4 \square + 5 \square = 104$$

Which digit is under the stickers?

- (A) 2    (B) 4    (C) 5    (D) 7    (E) 8

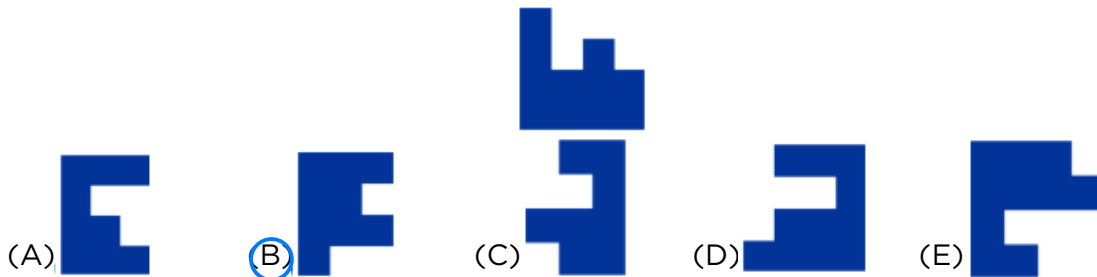
2. Vero's mother prepares sandwiches with two slices of bread each. A package of bread has 24 slices. How many sandwiches can she prepare from two and a half packages of bread?

- (A) 24    (B) 30    (C) 48    (D) 34    (E) 26

3. When Pinocchio lies, his nose gets 6 cm longer. When he tells the truth, his nose gets 2 cm shorter. When his nose was 9 cm long, he told three lies and made two true statements. How long was Pinocchio's nose afterwards?

- (A) 14 cm    (B) 15 cm    (C) 19 cm    (D) 23 cm    (E) 31 cm

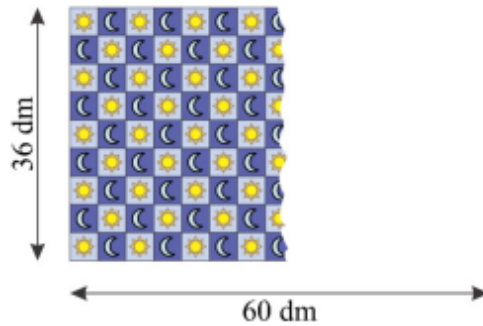
4. Which of the five pieces in the answers fits with the piece in the separate picture, so that together they form a rectangle?



5. There are oranges, apricots and peaches in a big basket. How many fruits are there in the basket if the peaches and the apricots together are 18, the oranges and the apricots together are 28 and 30 fruits are not apricots?

- (A) 46      (B) 20      (C) 40      (D) 38      (E) 29

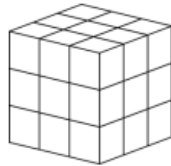
6. Peter bought a carpet 36 dm wide and 60 dm long. The figure shows part of this carpet. As seen, the carpet has a pattern of small squares containing either a sun or a moon. You can count that along the width there are nine squares. When the carpet is fully unrolled, how many moons will be seen?



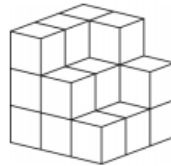
- (A) 68      (B) 67      (C) 65      (D) 63      (E) 60

## Level 3

1. Nathalie wanted to build the same cube as Diana had (see the picture).



Diana's cube



Nathalie's cube

However, Nathalie ran out of small cubes and built only the part of the cube, as you can see in the picture. How many more small cubes did Nathalie need to complete her cube?

- (A) 5      (B) 6      (C) 7      (D) 8      (E) 9
2. The number 36 has the property that it is divisible by the digit in the unit position, because 36 is divisible by 6. The number 38 does not have this property. How many numbers between 20 and 30 have this property?

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

3. Mary shades various shapes on square sheets of paper, as shown.



How many of these shapes have the same perimeter as the sheet of paper itself?

- (A) 2      (B) 3      (C) 4      (D) 5      (E) 6
4. During the final game of a soccer championship the teams scored a lot of goals. Six goals were scored during the first period of the game and the guest team was leading the score at the halftime break. During the second period, the home team scored 3 goals and as a result, they won the game. How many goals did the home team score altogether?

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



## Level 4

1. How many zeros are there at the end of the number  $201325 \times 201326 \times 201317$ ?

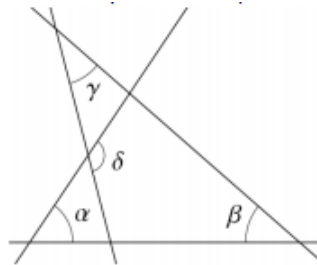
- (A) 0       (B) 1      (C) 2      (D) 4      (E) 8



2. Mark and Liza stand on opposite sides of a circular fountain. They then start to run clockwise round the fountain. Mark's speed is  $\frac{9}{8}$  of Liza's speed. How many circuits has Liza completed when Mark catches up with her for the first time?

- (A) 4      (B) 8      (C) 9      (D) 2      (E) 72

3. In the diagram,  $\alpha = 55^\circ$ ,  $\beta = 40^\circ$  and  $\gamma = 35^\circ$ . What is the value of  $\delta$ ?

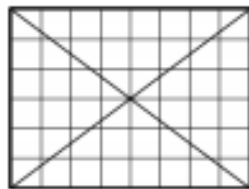


- (A)  $100^\circ$       (B)  $105^\circ$       (C)  $120^\circ$       (D)  $125^\circ$        (E)  $130^\circ$

4. Francois says: "On my 60th birthday I got many presents, and I hope to get as many on my 80th. Each of my children has as many children of their own as siblings, and none has grandchildren yet. My age is now equal to the number of all my living descendants." How old is Francois?

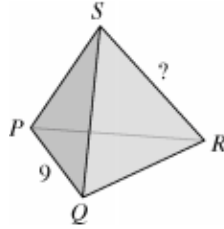
- (A) 62       (B) 64      (C) 67      (D) 70      (E) 72

5. In the  $6 \times 8$  grid shown, 24 of the cells are not intersected by either diagonal. When the diagonals of a  $6 \times 10$  grid are drawn, how many of the cells are not intersected by either diagonal?



- (A) 28      (B) 29      (C) 30      (D) 31       (E) 32

6. Each of the four vertices and six edges of a tetrahedron is marked with one of the ten numbers 1, 2, 3, 4, 5, 6, 7, 8, 9 and 11 (number 10 is omitted). Each number is used exactly once. For any two vertices of the tetrahedron, the sum of the two numbers at these vertices is equal to the number on the edge connecting these two vertices. The edge  $PQ$  is marked with the number 9. Which number is used to mark edge  $RS$ ?



(A) 4

(B) 5

(C) 6

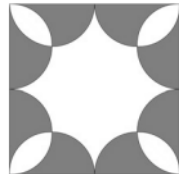
(D) 8

(E) 11



## Level 5

1. The eight semicircles built inside the square are congruent and the side of this square has length 4. What is the area of the non-shadowed part of the square?



- (A)  $2\pi$        (B) 8      (C)  $6 + \pi$       (D)  $3\pi - 2$       (E)  $3\pi$
2. The plan of the Scotts' family apartment is made in scale 1 : 50 and has a rectangular shape with dimensions 20 cm by 30 cm. What is the area of the apartment?
- (A)  $12 \text{ m}^2$        (B)  $150 \text{ m}^2$       (C)  $300 \text{ m}^2$       (D)  $450 \text{ m}^2$   
 (E)  $600 \text{ m}^2$
3. The diagram shows a zigzag shape made from six squares, each measuring 1 cm by 1 cm.



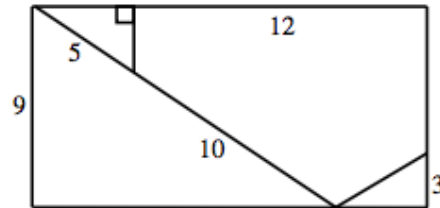
The shape has perimeter of length 14 cm. The zigzag shape is continued until it has 2013 squares. What is the length of the perimeter of the new shape, in cm?

- (A) 2022 cm       (B) 4028 cm      (C) 4032 cm      (D) 6038 cm  
 (E) 8050 cm
4. Roo wants to find a six-digit number, the sum of whose digits is even, and the product of whose digits is odd. Which of the following statements about such a number is correct?
- (A) Either two or four of the digits are even.      (B) Such a number cannot exist.  
 (C) The number of odd digits is odd.      (D) All six digits can be different.  
 (E) None of (A), (B), (C), (D) is correct.

5. A gardener wants to plant 100 trees (oaks and birches) along one side of a trail in the park. The number of trees between any two oaks must not be equal to five. Of these 100 trees, what is the greatest number of oaks that the gardener can plant?

- (A) 48      (B) 50      (C) 52      (D) 60      (E) 80

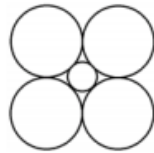
6. The diagram shows a rectangle, which is divided into four pieces by cutting along the straight lines shown. The four pieces are then rearranged to form a square. What is the length of the perimeter of the square?



- (A) 40      (B) 48      (C) 52      (D) 56      (E) 60

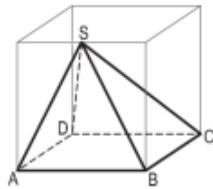
## Level 6





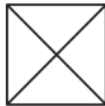
1. Four circles of radius 1 are touching each other and a smaller circle as seen in the picture. What is the radius of the smaller circle?



- (A)  $\sqrt{2} - 1$     
 (B)  $\frac{1}{2}$     
 (C)  $\frac{\sqrt{3}}{4}$     
 (D)  $\frac{3}{4}$     
 (E)  $\frac{7}{16}$

2. In the cube to the right you see a solid, non-transparent pyramid  $ABCD S$  with base  $ABCD$ , whose vertex  $S$  lies exactly in the middle of an edge of the cube. You look at this pyramid from above, from below, from behind, from ahead, from the right and from the left. Which view does not arise?

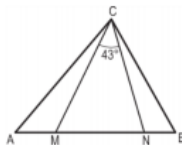


- (A)     
 (B)     
 (C)     
 (D)     
 (E) 

3. How many positive integers  $n$  exist such that both  $\frac{n}{3}$  and  $3n$  are three-digit integers?

- (A) 12    
 (B) 33    
 (C) 34    
 (D) 100    
 (E) 300

4. In the triangle  $ABC$  the points  $M$  and  $N$  on the side  $AB$  are such that  $AN = AC$  and  $BM = BC$ . Find  $\angle ACB$  if  $\angle MCN = 43^\circ$ .



- (A)  $86^\circ$     
 (B)  $89^\circ$     
 (C)  $90^\circ$     
 (D)  $92^\circ$     
 (E)  $94^\circ$

5. Let  $f(x)$ ,  $x \in R$  be the function defined by the following properties:  $f$  is periodic with period 5 and  $f(x) = x^2$  when  $x \in [-2, 3)$ . What is  $f(2013)$  ?

- (A) 0            (B) 1            (C) 2             (D) 4            (E) 9

6. Julian has written an algorithm in order to create a sequence of numbers as  $a_1 = 1$ ,  $a_{m+n} = a_m + a_n + mn$ , where  $m$  and  $n$  are natural numbers. Find the value of  $a_{100}$ .

- (A) 100            (B) 1000            (C) 2012            (D) 4950             (E) 5050