



**2<sup>WMO</sup>  
014**

# **World Mathematics Olympic Competition**

**The 7<sup>th</sup> world cup ( Columbia, America )**

# **L1**



Name: \_\_\_\_\_ Grade: \_\_\_\_\_

Country: \_\_\_\_\_ Number: \_\_\_\_\_



WMO  
2014

# Level 1: The World Cup Finals

Total score: 100 Time: 90min



## Section 1: Single choice questions

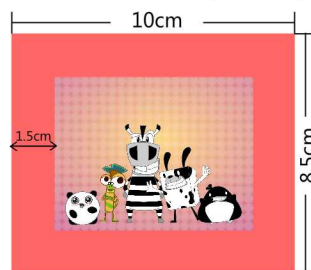
There are 10 questions in this section. Each question has only one correct answer.

Please select the correct answer from the answer list.

5 scores each question, totally 50 scores.

1. A photograph was pasted on a piece of paper. The size of the photograph is smaller than that of the paper so there is a 1.5cm–margin around the photograph; meaning that the edges of the photograph are 1.5cm away from the edges of the paper. If the size of the paper is 10cm by 8.5cm, the size of the photograph is ( )  $\text{cm}^2$ .

- (A) 76                      (B) 65  
(C) 59.5                    (D) 38.5

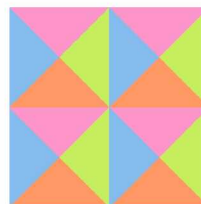


2. Amy and Mary have the same amount of summer holiday homework. 6 days before the new term, Amy still has not started doing her homework whereas Mary has already finished 60 questions for her homework. On the first day of the new term, both Amy and Mary have finished their homework. We know that in the last 6 days of the holiday, the number of the questions that Amy did per day is 3 times of that of Mary did per day. How many questions did Amy do per day? ( )

- (A) 6                      (B) 9                      (C) 12                      (D) 15

3. How many squares are there in the picture below? ( )

- (A) 11                      (B) 10  
(C) 9                        (D) 8



4. Mr. A, B, C, D, E and F, each person planted one tree. As shown in the picture below, some planted big trees and the others planted small trees. There are 2 big trees between A's and E's trees; there is 1 small tree between B's and F's trees. Which tree is Mr. C's? ( )



- (A) 2                      (B) 4                      (C) 6                      (D) 2 or 6

5. A 9-person scientific expedition team was lost in the woods and their food can only last for 5 days. On the next day, they met another team which was also lost and had no food left. The two teams decided to join together to find their way out. As the size of the team was increased while the amount of the food remained the same, they had only 3 days food left. How many members are in the second team? ( )

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

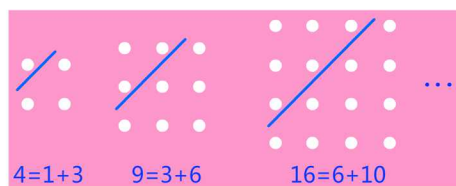
6. 6 persons are standing side by side for photographs. If Lily must be the second person from the left, then there are, at most, ( ) ways for them to line up.

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

7. Pythagoras of Samos, an Ionian Greek philosopher and mathematician called the numbers like 1, 3, 6, 10, ... "triangular number", and called the numbers like 1, 4, 9, 16, ... "square number". Pythagoras found that any square number that is greater than 1 is the sum of two adjacent triangular numbers. The picture below gives us 3 examples of Pythagoras' s finding. There is another example in the answer list; Can you tell which one is? ( )

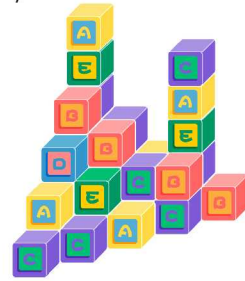
- (A)  $13=3+10$       (B)  $25=9+16$

- (C)  $36=15+21$       (D)  $49=18+31$



8. How many cubes are there in the picture below? ( )

- ( A ) 34                      ( B ) 35  
 ( C ) 36                      ( D ) 38



9. Mr. B died 129 years after Mr. A was born. Mr. A died in 1900 AD, the sum of their life span is 150 years. Can you tell what year was Mr. B born in? ( )

- ( A ) 1780                      ( B ) 1879                      ( C ) 1889                      ( D ) 1899

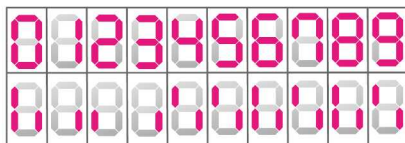
10. There is a square shaped garden with a size of 21m by 21m. We want to place some flowerpots along its borders at 3-meter intervals, from one corner to the next. How many flowerpots do we need? ( )

- ( A ) 22                      ( B ) 24                      ( C ) 28                      ( D ) 32

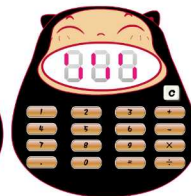
## Section 2: problem solving

10 scores each question, totally 50 scores.

1. The pictures below are the screen of a calculator. However, the screen is not working properly so some parts are not displaying as they should be. The number in picture 2 is the result of the number in picture 1 multiplied by 6. Are you able to give the possible number displayed on picture 1?

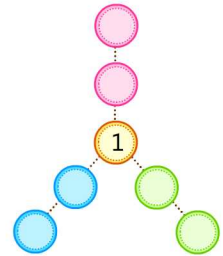


picture 1



picture 2

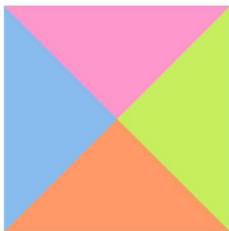
2. Please put the following numbers 3、5、7、9、11、13 into the 6 circles in the picture so that each chain would have 3 numbers in total. Please make sure that the sums of the 3 numbers on each chain are the same.



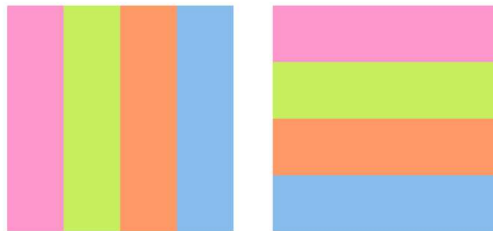
3. We need to divide a square-shaped field into 4 parts to grow 4 different kinds of plants. There are three rules for dividing:

- the area of each part must be the same.
- the shape of each part must be the same.
- the shape of the entire field after division must be axial symmetrical.

The pictures below demonstrated 2 ways to divide the field.



1

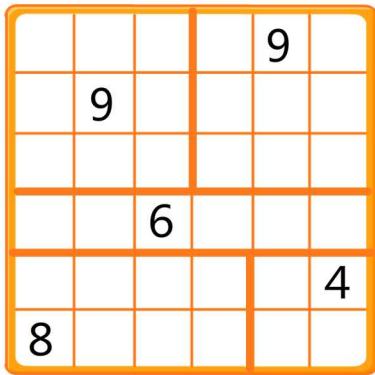


2

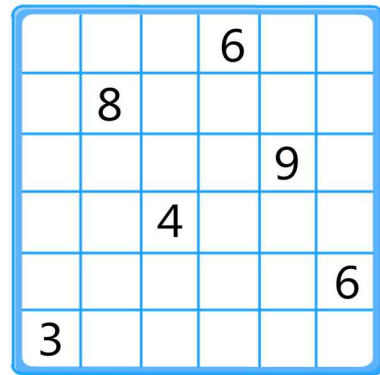
Please give another 3 method to divide the field.



4. As shown in the picture 1, all rectangles inside the big square are composed of small quadrates. The number of small quadrates that are used to form any given rectangle is the number displayed in it. Please draw rectangles in the picture 2 by applying the same method.



picture 1



picture 2

5. A transparent-shaped cuboid water container has water in it. Can you design a method to determine whether the volume of water is exactly the half volume of the container? Please note that there are no instruments you may use and do not spill water.

