注意：

允許學生個人、非營利性的圖書館或公立學校合理使用本基金會網站所提供之各項試題及其解答。**可直接下載而不須申請。**

重版、系統地複製或大量重製這些資料的任何部分，必須獲得財團法人臺北市九章數學教育基金會的授權許可。

申請此項授權請電郵 ccmp@seed.net.tw

Notice:

Individual students, nonprofit libraries, or schools are permitted to make fair use of the papers and its solutions. Republication, systematic copying, or multiple reproduction of any part of this material is permitted only under license from the Chiuchang Mathematics Foundation.
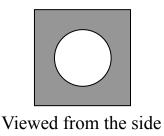
Requests for such permission should be made by e-mailing Mr. Wen-Hsien SUN ccmp@seed.net.tw
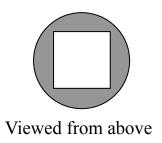
2014 Taiwan Selection Test for PMWC and EMIC

Preliminary Round Paper II   (Time Allowed : 90 Minutes)

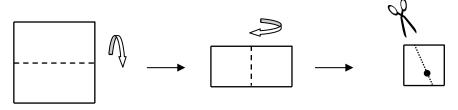● **Write down all answers on the answer sheet. Each problem is worth 25 points and the total is 300 points.**

1. The sum of the two digits of a number is 8. When the digits are written down in the reverse order, the new number is 18 more than the old number. What is the old number?

2. As a reward for winning a track meet, each of the 9 team members receives an award of 1500 dollars. The coach also receives an award which is 900 dollars more than the average award for the 10 of them. How much is the coach's award?

3. In a party with more than 30 but less than 40 children, each boy shakes hands with 2 girls while each girl shakes hands with 3 boys. How many boys are at the party?

4. Beef sausages cost 150 dollars per kilogram while pork sausages cost 200 dollars per kilogram. A housewife spends all of her money and buys an equal number of beef sausages and pork sausages. If she spends half of her money on beef sausages and the other half on pork sausages, she will get 2 more kilograms of sausages. How much money does she have?

5. When viewed from the side, a solid appears as shown in the diagram below on the left. When viewed from above, it appears as shown on the right. Make a sketch of this solid.

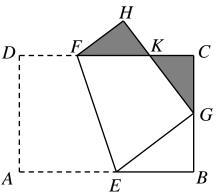Viewed from the side

Viewed from above

6. In how many ways can 20 beads be distributed into 8 boxes so that each box contains an odd number of beads, if the beads are indistinguishable and the boxes are indistinguishable?
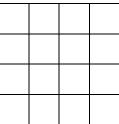
7. A 2 × 2 piece of paper is folded twice into a 1 × 1 stack of thickness 4. A straight cut is made, and the stack is unfolded into a number of pieces. What are the possible numbers of pieces?

8. In a certain year, a particular day in each month is not a Sunday. What is that day of the month?

9. A rectangular piece of paper *ABCD* with *AD* = 12 cm is folded along the segment *EF* , with *E* on *AB* and *F* on *CD*, such that *A* lands on the midpoint *G* of *BC* and *D* lands on a point *H* outside *ABCD*. *K* is the point of intersection of *CF* and *HG*. If the triangles *FHK* and *GCK* are congruent, what is the area, in cm², of *ABCD*?

10. A 8056-digit number consisting of 2014 copies of 2014 written end-to-end. There is a remainder when it is divided by 11. What is the last digit of the quotient?

11. Each square of a 4 × 4 table contains either + or −. The four corner squares of any 4 × 4, 3 × 3 or 2 × 2 sub-table contain two +s and two −s. Find all such tables up to symmetry.

12. Three black markers and three white markers placed alternately in six adjacent squares somewhere in an infinite row. In each move, you may shift two adjacent markers to two adjacent vacant squares, without reversing the order of the two markers. What is the minimum number of moves to make the markers occupy six adjacent squares again, but with all three white markers to the left of all three black markers?