

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

2015 Taiwan Selection Test for PMWC and EMIC

Preliminary Round Paper II (Time Allowed : 90 Minutes)

- Each question is worth 25 marks for a maximum score of 300 marks. Write down all answers on the answer sheet. Each problem is worth 25 points and the total is 300 points.

1. Each of two four-digit numbers consists of four different digits. What is the maximum value when the smaller number is subtracted from the larger one?



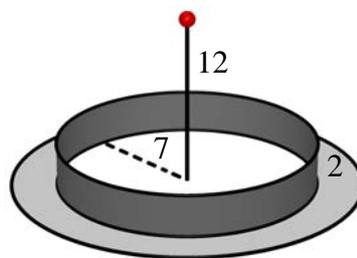
2. A family has seven daughters. Each one after the first is two years younger than the one born before. If the eldest daughter is three times as old as the youngest, how old is the eldest?



3. What is the sum of all the digits in the first 9999 positive integers?



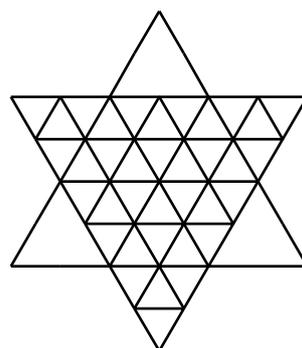
4. The radius of a round enclosure is 7 m. It is surrounded by a fence of height 2 m along its circumference. A lamp is on top of a lamp post of height 12 m, which is at the centre of the enclosure. What is the area, in m^2 , of the shadow cast on the ground outside the enclosure if we take $\frac{22}{7}$)



5. In how many ways can Adam, Betty and Carol share 12 apples, with each getting at least one?



6. All triangles in the diagram are equilateral. Some of them overlap others. How many different triangles are there?



7. The 100000 tickets for an event are numbered from 00000 to 99999. If a number contains two adjacent digits which differ by exactly 5, it wins a door prize. How many door prizes will be needed if all tickets are sold?



8. Of 8 coins, 7 are known to be real and have the same weight. The other one may also be real, but may be a fake coin which is either heavier or lighter than a real coin. We want to know if there is a fake coin. If so, we wish to know whether it is heavier or lighter, but it is not necessary to identify the fake coin. What is the minimum number of weighing on a balance that would accomplish the task?



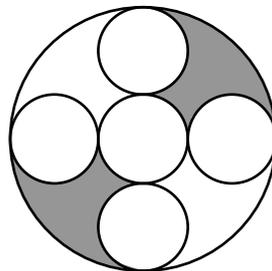
9. Dick goes to school by bicycle, riding at the same constant speed every day. One day, $\frac{3}{4}$ of the way to school, the bicycle breaks down, and he has to walk the rest of the way at a constant speed. If the amount of time Dick takes to go to school that day is twice the normal amount, how many times is his riding speed compared to his walking speed?



10. The prices for each goose egg, chicken egg and quail egg are \$20, \$4 and \$2 respectively. Dee spends \$400 and buys 100 eggs, with at least one egg of each kind. Of the numbers of eggs of each kind that she buys, two are equal. How many chicken eggs has Dee bought?



11. The area of each of five circles is 133 cm^2 . They are arranged in the form of cross inside a circle whose radius is three times as large. What is the total area, in cm^2 , of the shaded parts in the diagram, taking $\frac{22}{7}$?



12. Each of 100 boxers has different strength, and in any match, the stronger boxer always wins. How many matches are needed to determine the strongest boxer and the second strongest one?

