第十一屆全港小學數學挑戰賽(2024-2025)
The 11th Hong Kong Primary Mathematics Challenge (2024-2025)

決賽（二零二四年十二月七日）
Final (7th December, 2024)

小五組 組別項目 試卷
Primary 5 Group Event Question Paper

參賽者須知 Instructions to Contestants

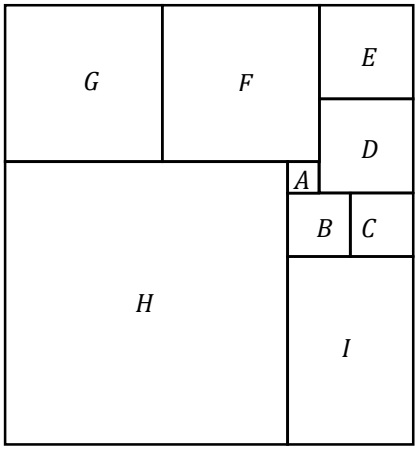
1. 在比賽過程中，參賽者必須將准考證放在桌上。
   You should place your Admission Form on your desk for the whole session.
2. 於比賽期間必須關掉所有手提電話、通訊工具及其他響鬧裝置。
   During the competition, you should switch off your mobile phone and any other electronic or communication devices that can emit sound.
3. 本項目以筆試形式舉行，須於限時 45 分鐘內完成所有題目。
   Contestants should finish all questions in this 45-minutes written test.
4. 在答題紙上填寫學校名稱、參賽者姓名、參賽者編號、座位編號。
   Write your name, admission number, seat number and school name on the front cover of your answer sheet.
5. 參賽者於比賽時只准使用大會提供之草稿紙。
   You can only use the rough work sheet provided by the organizer.
6. 參賽者不可於比賽中使用計算機。
   The use of calculators is NOT allowed.
7. 每題只需把答案填寫在大會提供之答題紙上，否則不予評分。參賽者不需填寫計算步驟。
   Put your answers on the answer sheet provided, otherwise, the answers will not be marked. You are not required to show the steps in your calculations.
8. 作答時，每題的答案均須以 0 至 9999 之間的整數表示，小於 1000 的答案均須補「0」以湊足四位數字。
   Each answer must be given as an integer between 0 and 9999. In case of an answer less than 1000, leading zeros should be included to make up four digits.
9. 除特殊情況外，參賽者於本項目完結前不能提早交卷或離場。
   Under normal circumstances, contestants are not allowed to leave the contest venue before the end of this session.
10. 違反比賽規則者有可能被取消參賽資格。
    Any contestant who violates the rules and regulations of the competition might risk disqualification.
11. 參賽者如對比賽過程或試題內容有任何疑問或爭議，參賽者須於當天比賽結束後立即向大會提出，否則不予受理。大會保留是次比賽的所有最終決定權。
    If you have any queries, you should contact the officer-in-charge immediately after the competition. Late queries will not be entertained. The decision of the organizing committee will be final.

時限：45 分鐘　　總分：400
Time Allowed:45 minutes　　Total marks: 400

1. 求 $a+2b+3c=36$ 的正整數解的數目。 (16 分)
Find the number of positive integral solutions of the equation $a+2b+3c=36$. (16 marks)

2. 求下列算式的值。 (16 分)
Find the value of the following expression. (16 marks)
$11^2 + 12^2 + 13^2 + 14^2 + 15^2 + 16^2 + 17^2 + 18^2 + 19^2 + 20^2$

3. 下圖中，A、B、C、D、E、F、G、H 是正方形。設 A 和 B 的邊長分別為 1 cm 和 2 cm。求矩形 I 的面積。 (22 分)
In the figure, A, B, C, D, E, F, G and H are squares. Given that the sides of A and B are 1 cm and 2 cm respectively. Find the area of the rectangle I. (22 marks)

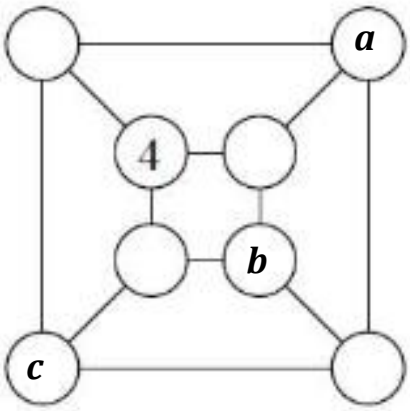


4. $\frac{44}{37}$ 可以寫成為 $1+\cfrac{1}{A+\cfrac{1}{B+\cfrac{1}{C}}}$，其中 A， B， C，都是正整數，問 $A+B+C$ 的數值是多少？ (20 分)
$\frac{44}{37}$ can be written as $1+\cfrac{1}{A+\cfrac{1}{B+\cfrac{1}{C}}}$, while A, B and C are positive integers, what is the value of $A+B+C$? (20 marks)

5. 一間長方形的房間，長 688cm、闊 288cm，用相同大小的正方形木地板鋪滿，每片正方形木地板的邊長最大值是多少？ (18 分)
A rectangular room of length 688cm and width 288cm is covered with square wooden floors of the same size. What could be the greatest length of each square wooden floors? (18 marks)

6. 現有四個數字 A，B，C 和 D。已知 A 加上 2，B 減去 2，C 乘以 2 和 D 除以 2 的結果相同。若這四個數字的總和為 999，求 A 的值。 (26 分)
There are four numbers, A, B, C and D. It is given that adding 2 to A, subtracting 2 from B, multiplying 2 with C and dividing D by 2 give the same results. If the sum of these four numbers equals to 999, find A. (26 marks)

7. 請把數字 1、2、3、6、7、8、9 填入下圖的圓圈中，使得任意兩個有線段直接相連的圓圈內的數字之差都大於 2，求 $a + b + c$ 的值。 (24 分)
Please fill in the numbers 1, 2, 3, 6, 7, 8 and 9 into the circles in the figure below. So, the difference between the numbers in any two circles connected by the line segment is greater than 2. Find the value of $a + b + c$. (24 marks)



8. 若 a、b、c 和 d 是正整數使得 $a+b+c+d=a\times b\times c\times d$，求 $a+b+c+d$ 的值。 (25 分)
If a, b, c and d are positive integers such that $a + b + c + d = a \times b \times c \times d$, find the value of $a + b + c + d$. (25 marks)

9. 求 $1^2-2^2-3^2+4^2-5^2+6^2+7^2-8^2+9^2-10^2-11^2+12^2-13^2+14^2+15^2-16^2+\cdots$ $+2017^2-2018^2-2019^2+2020^2-2021^2+2022^2+2023^2-2024^2$ 的值。 (24 分)
Find the value of $1^2-2^2-3^2+4^2-5^2+6^2+7^2-8^2+9^2-10^2-11^2+12^2-13^2+14^2$ $+15^2-16^2+\cdots+2017^2-2018^2-2019^2+2020^2-2021^2+2022^2+2023^2-2024^2$.
(24 marks)

10. $3 + 7 + 10 + 17 + 27 + \ldots + 664279 + 1074826 + 1739105 = \overline{45530XY}$，$X+Y$ 的數值是多少？ (27 分)
$3 + 7 + 10 + 17 + 27 + \ldots + 664279 + 1074826 + 1739105 = \overline{45530XY}$, what is the value of $X + Y$? (27 marks)

11. 某工程由甲做單獨做 46 天，再由乙單獨做 18 天可以完成，如果甲乙兩人合做 25 天完成，現在甲先單獨做 13 天，然後再由乙單獨接著做，還需多少天可以完成? (30 分)
A project can be completed in 46 days by A alone, then 18 days by B alone. If A and B can finish it together in 25 days, now A does it alone for 13 days, then B does it alone, how many more days will it take to complete? (30 marks)

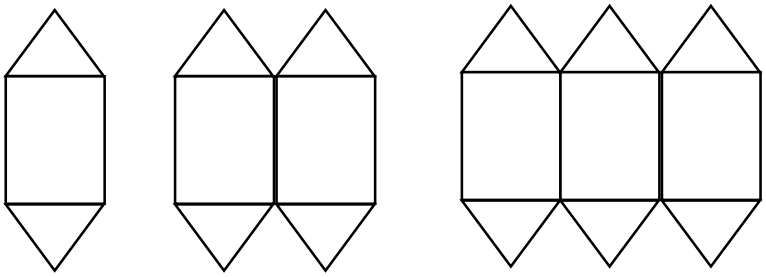
12. 求 3528，5292 和 8064 的最大公因數。 (28 分)
Find the H.C.F. of 3528, 5292 and 8064. (28 marks)

13. 有 100 個燈泡排成一排，每個燈泡順序編排號碼。最初，全部燈泡都是關閉的。第一輪，所有燈泡都被打開。第二輪，只有編號是 2 的倍數的燈泡會被切換狀態（開的關、關的開）。第三輪，只有編號是 3 的倍數的燈泡會被切換狀態。如此類推，直到第 100 輪。問最後有多少個燈泡是亮著的？ (28 分)

There are 100 light bulbs lined up in a row, each with a sequential number. Initially, all the bulbs are off. In the first round, all the bulbs are turned on. In the second round, only the bulbs that are multiples of 2 will be toggled (on to off, off to on). In the third round, only the bulbs that are multiples of 3 will be toggled. This continues until the 100th round. How many bulbs are lit at the end? (28 marks)

14. 家明使用木條去砌成以下圖形。某圖由 2507 枝木條組成。求該圖為第幾幅圖。 (30 分)

Jason used sticks to form the following figures. A figure in the pattern has a total 2507 sticks. What is the Figure Number? (30 marks)



(圖 1) (Figure 1)　(圖 2) (Figure 2)　(圖 3) (Figure 3)

15. 書架上只有小說和教科書。小說數量是教科書的兩倍。若五分之二的小說和四分之三的教科書是硬皮書，則所有硬皮書佔書架上所有書的幾分之幾？ (32 分)

There are only novels and textbooks on the bookshelf. There are twice as many novels as textbooks. If two-fifths of the novels and three-quarters of the textbooks are hardcover, what fraction of all the books on the bookshelf are hardcover? (32 marks)

16. 盒子裡有 2024 枚棋子。小明每次從盒中取出的棋子數量都相等，且大於 1，而最後一次剛好取走所有的棋子。小明共有多少種不同的取法？ (34 分)

There are 2024 pieces in the box. David takes an equal number of pieces each time, with the number being greater than 1, and he takes all the pieces in the last turn. How many different ways are there for David to take the pieces? (34 marks)

試卷完 END OF PAPER