

**第十屆全港小學數學挑戰賽(2023-2024)**  
**The 10<sup>th</sup> Hong Kong Primary Mathematics Challenge (2023-2024)**

**決賽 (二零二三年十二月二日)**  
**Final (2<sup>nd</sup> December, 2023)**

<b>小五組</b>	<b>組別項目</b>	<b>試卷</b>
<b>Primary 5</b>	<b>Group Event</b>	<b>Question Paper</b>

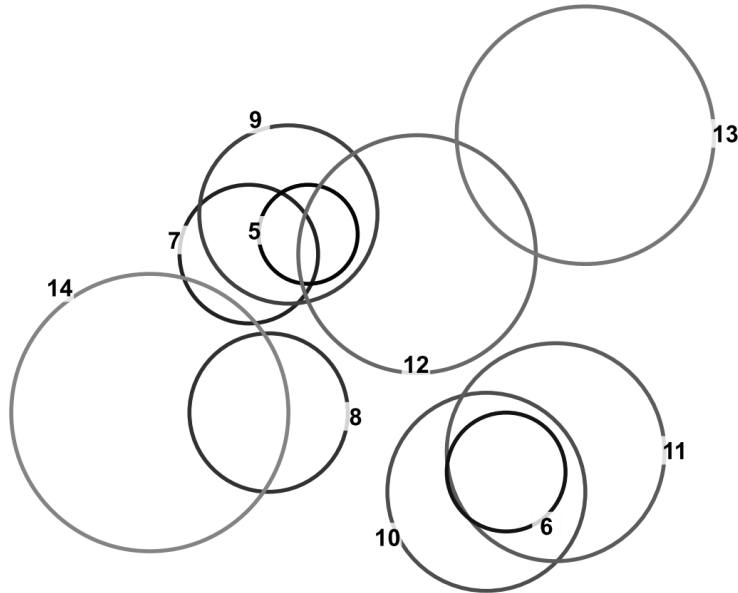
**參賽者須知 Instructions to Contestants**

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  
Time Allowed: 45 minutes

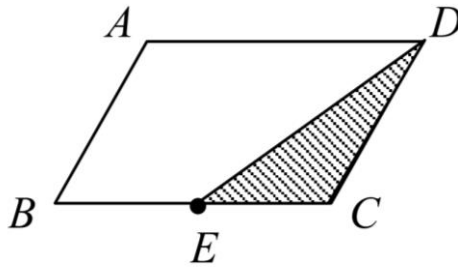
總分：400  
Total marks: 400

1. 圖中各圓的半徑分別為 5、6、7、...、14 個單位，並標示在各圓上。已知擦去其中一些圓後，剩下的圓就沒有交點。求擦去的圓的半徑總和的最小可能值。 (16 分)  
In the figure, the circles have radii 5, 6, 7, ..., 14 units as marked on the circles respectively. It is known that after removing some of the circles, the remaining circles will have no intersection. Find the least possible value of the sum of the radii of the removed circles. (16 marks)



2.  $\frac{3}{14}$  化成小數後，小數點後第 1993 個數字是什麼？ (16 分)  
Convert  $\frac{3}{14}$  into decimal. What is the number at 1993 decimal places? (16 marks)
3. 一個 7 位數  $B = \overline{701X3Y2}$ ，其中  $X$  和  $Y$  是包括 0 至 9 的整數。假設  $B$  能被 6 整除。求  $\overline{X3Y2}$  的最大值。 (18 分)  
Consider the 7-digit number  $B = \overline{701X3Y2}$ , where  $X$  and  $Y$  are integers from 0 to 9 inclusive. Suppose  $B$  is divisible by 6. What is the greatest value of  $\overline{X3Y2}$ ? (18 marks)
4. 95256 有多少個不同的因數。 (22 分)  
How many distinct factors for 95256? (22 marks)
5. 將  $k$  塊曲奇分給 100 名學生，每名學生至少分得一塊曲奇，且沒有 4 名學生分得相同數目的曲奇，求  $k$  的最小值。 (20 分)  
Divide  $k$  cookies among 100 students such that each student receives at least one cookie and no four students obtain same number of cookies. Find the least value of  $k$ . (20 marks)
6.  $x$  是「一」個大於 2023 的正整數。已知  $x$  的因數數目和 2023 相同，求  $x$  的最小值。 (24 分)  
 $x$  is a positive integer greater than 2023. Given that the number of factors of  $x$  is the same as 2023, find the minimum value of  $x$ . (24 marks)

7. 圖中的平行四邊形  $ABCD$  中， $BE=EC$ 。若陰影部分的面積為  $5 \text{ cm}^2$ ，請問平行四邊形  $ABCD$  的面積為多少  $\text{cm}^2$ ? (28 分)  
 In parallelogram  $ABCD$ ,  $BE = EC$ . The area of the shaded region is  $5 \text{ cm}^2$ . What is the area of parallelogram  $ABCD$ , in  $\text{cm}^2$ ? (28 marks)

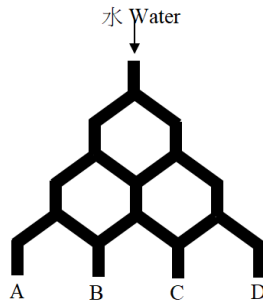


8. 求下列算式的值。 (24 分)  
 Find the value of the following expression. (24 marks)  
 $3 + 4 + 7 + 11 + 18 + 29 + 47 + 76 + 123 + 199 + 322 + 521 + 843 + 1364 + 2207 + 3571$
9. 以下每一個中文字代表不同數字，求「我愛數學」代表的四位數？ (24 分)  
 In the following calculation, each Chinese character represents one number, write down the four digits represented by “我愛數學”. (24 marks)

$$\begin{array}{r} \text{我愛數學} \\ -) \text{數數愛我} \\ \hline \text{學數我愛} \end{array}$$

10. 已知  $X$  和  $Y$  為正整數，使得  $X^2 - Y^2 = 2024$ ，求  $Y$  的最大值。 (26 分)  
 It is known that  $X$  and  $Y$  are positive integers such that  $X^2 - Y^2 = 2024$ , find the greatest value of  $Y$ . (26 marks)
11. 已知三個數 5048、6727 和 7457，將它們除以整數  $X$  時，所得的餘數都等於整數  $Y$ 。求  $X+Y$  之值。 (28 分)  
 There are three numbers: 5048, 6727 and 7457. When they are divided by  $X$  (integer), the remainders are both equal to  $Y$  (integer). What is  $X+Y$ ? (28 marks)
12. 將 1, 2, 3... 連續寫下，形成一串數 123456789101112131415...。這串數中從左起第 1000 個數字是甚麼？ (28 分)  
 The numbers 1,2,3 are written down successively to form a series of numbers 123456789101112131415... . What is the 1000<sup>th</sup> digit in this series of numbers if it is counted from the left? (28 marks)
13. 找出 400 以內所有含有以下特性的 3 位數字，求他們的總和。 (30 分)  
 $a^3 + b^3 + c^3 = abc$   
 例子： $1^3 + 5^3 + 3^3 = 153$   
 Find the sum of all 3-digit numbers within 400 that have the following characteristics. (30 marks)  
 $a^3 + b^3 + c^3 = abc$   
 e.g.  $1^3 + 5^3 + 3^3 = 153$

14.



圖中是一個水管系統，水從上方入口進入並往下流，當水流到分支時，水會平均分成兩份向兩邊流。當 A 出口的總流水量達到 2L 時，求 B 出口的總流水量。

(30 分)

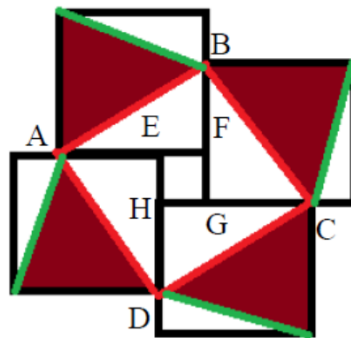
The figure shows a water pipe system. Water enters from the entry at the top and flows downward. When the water flows into the branch, it is divided into two equal parts. When the total flow of the Exit A reaches 2L, find the total flow of the Exit B. (30 marks)

15. 下圖由四個相同正方形組成的圖案，且正方形的邊長為正整數。 $EFGH$  為正方形且其面積也是正整數。若  $ABCD$  的面積為  $13 \text{ cm}^2$ ，求陰影部分的面積。

(32 分)

The figure is formed by four identical squares and its side is a positive integer.  $EFGH$  is a square and the area is also a positive integer. Suppose the area of  $ABCD$  is  $13 \text{ cm}^2$ , find the area of shaded part.

(32 marks)

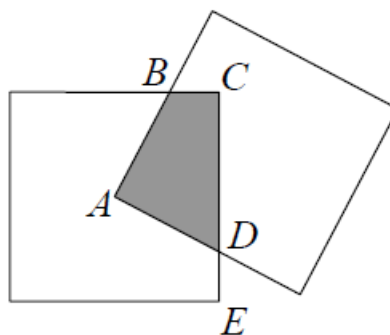


16. 將兩個邊長為 8 cm 的正方形疊放在一起，使得上面的正方形其中一個頂點與下面的正方形中心點重合，如下圖所示。已知  $BC=DE$ ，求陰影區域的面積？

(34 分)

Two squares of side 8 cm intersect such that the corner of one square coincides with the centre of the other square, as shown in the figure. If it is known that  $BC=DE$ , what is the area of the shaded region?

(34 marks)



試卷完 END OF PAPER