

第三屆全港小學數學挑戰賽(2016-2017)
The 3rd Hong Kong Primary Mathematics Challenge (2016-2017)

決賽 (二零一七年四月一日)
Final (1st April, 2017)

小六組	組別項目	試卷
Primary 6	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、參賽者姓名及班級、參賽者編號、座位編號。
Write your name, class, 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. 除非問題特別聲明，分數的答案須化至最簡。
Unless otherwise stated by the question, answers of fraction should be expressed in their simplest form.
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.

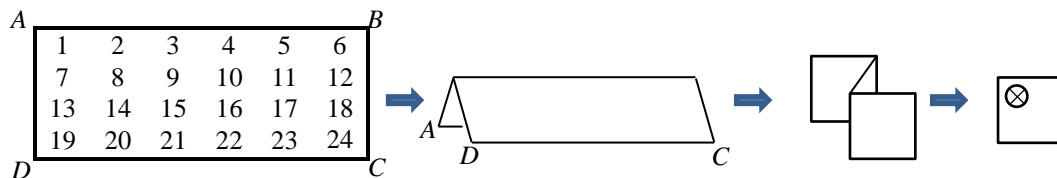
時限：四十五分鐘
Time allowed: 45 minutes

總分：400
Total marks: 400

1. 在長方形紙上寫上由 1 到 24 的數字，如圖所示對摺了三次，並在一角打上小孔。之後將長方形紙展開，求所有打上小孔的數字。(14 分)

A piece of rectangular paper numbered from 1 to 24 is folded 3 times as follows. If a small hole is made at one corner of the paper after folding.

Find all the numbers with a hole on it when the paper is unfolded. (14 marks)



2. 計算在 1 至 200 之中有多少個質數，它們數字之和是等於 4。

(例如：質數 2017 的數字之和是 $2 + 0 + 1 + 7 = 10$)

(14 分)

How many prime numbers in between 1 to 200, the sum of digits of the prime number is equal to 4?

(Example: the sum of digits of the prime number 2017 is $2 + 0 + 1 + 7 = 10$)

(14 marks)

3. 一個四位數，除以 17，餘數是 5，這個四位數最大的值是多少？

(15 分)

When a 4-digit number is divided by 17, the remainder is 5.

Find the greatest value of that 4-digit number.

(15 marks)

4. 如果 $7m + 2n = 137$ ，而 m, n 為不同的質數。求 $m + n$ 的最小值。

(17 分)

If $7m + 2n = 137$, where m, n are different prime numbers.

Find the least value of $m + n$.

(17 marks)

5. 把一個 $2017\text{ cm} \times 41\text{ cm}$ 的長方形完全切割成多個(大小可以不相同)正方形，最少可以切割出多少個正方形？

(18 分)

A $2017\text{ cm} \times 41\text{ cm}$ rectangle is completely cut into several squares (sizes may not be the same). Find the least number of squares being cut.

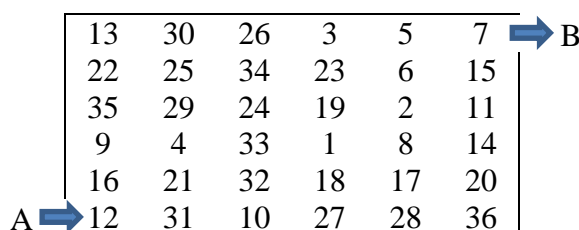
(18 marks)

6. 若只可以橫向或直向走動，下圖中由 A 點至 B 點，途中所經過的數值之和最少是多少？

(24 分)

The diagram below shows a map. If you are only allowed to move horizontally or vertically from point A to point B, find the least value of the sum of the numbers you passed through.

(24 marks)



7. 已知一數列 1、2、3、4、...、2017。

從這數列中，最少要刪去多少個數，才能使剩下的數的積的個位數是 3？ (26 分)

It is given the sequence 1, 2, 3, ..., 2017.

What is the least number of the numbers in the sequence should be deleted so that the unit digit of the product of the remaining numbers is 3? (26 marks)

8. 一選舉中有甲、乙、丙三人參選，其中只有得票最高的一位會當選。已知有 2400 人投票，當中沒有廢票。現點票進行中，候選人甲、乙、丙分別暫得 299 票、328 票及 478 票。

若候選人丙要保證當選，他最少額外需要多少票？ (29 分)

There are 3 candidate A, B and C in an election. The one who get the greatest number of votes wins the election. It is known that 2400 people have casted their votes and all the votes are valid. Now, the count is processing. At this moment, candidates A, B and C obtain 299 votes, 328 votes and 478 votes respectively.

What is the least number of additional votes candidate C must obtain to ensure him to win the election? (29 marks)

9. 將 16 個長闊高分別為 2cm、5cm 和 9cm 的小長方體合併成一大長方體，大長方體的表面面積最大是多少？ (29 分)

A larger cuboid is formed by combining 16 smaller cuboids with the dimensions of $2\text{cm} \times 5\text{cm} \times 9\text{cm}$. What is the largest surface area of the larger cuboid? (29 marks)

10. 如
If

$$\begin{array}{cccc} 1 = \bullet, & 2 = \bullet\circ, & 3 = \bullet\bullet, & 4 = \bullet\circ\circ, \\ 5 = \bullet\circ\bullet, & 6 = \bullet\bullet\circ, & 7 = \bullet\bullet\bullet, & 8 = \bullet\circ\circ\circ, \dots \end{array}$$

求 $\bullet\bullet\circ\circ\bullet\circ\bullet\circ$ 的值。 (30 分)

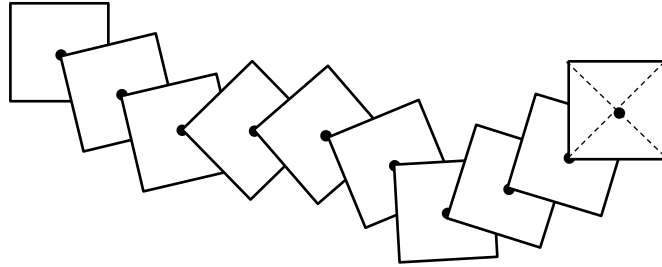
Find the value of $\bullet\bullet\circ\circ\bullet\circ\bullet\circ$. (30 marks)

11. 下圖是由 10 張 $6\text{ cm} \times 6\text{ cm}$ 的正方形手工紙堆疊在枱面上情況，在上的手工紙一角必須貼在對下的手工紙的中心點，求該 10 張手工紙所佔枱面的面積。 (31 分)

There are 10 square cardboards in $6\text{ cm} \times 6\text{ cm}$ stacked up on the table, a corner of the cardboard on top must point to the centre of the cardboard below.

Find the total area covered by these 10 cardboards on the table.

(31 marks)



12. 根據圖中數字的排列，如果第四行第二個數字是 11，第 20 行第 17 個數字是多少？

(33 分)

Follow the number patterns in the figure. If 11 is the 2nd number on the 4th row, find the value of the 17th number on the 20th row.

(33 marks)

				1			
			2	3	4		
	5	6	7	8	9		
10	11	12	13	14	15	16	
⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮

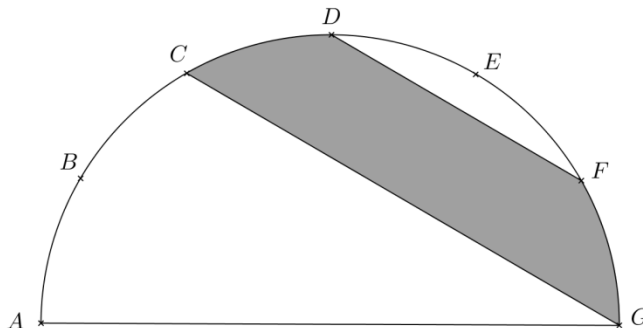
13. 下圖為一個以 AG 作直徑的半圓。半圓弧上由點 B 、 C 、 D 、 E 、 F 平均分成 6 等段， CG 及 DF 均為直線。

已知半圓的面積為 474 cm^2 ，求陰影區域的面積。

(38 分)

A semi-circle with diameter AG is shown in the diagram below. The entire arc of the semi-circle is divided into 6 equal parts by points B , C , D , E and F , where CG and DF are straight lines. Given that the area of the semi-circle is 474 cm^2 , find the area of the shaded region.

(38 marks)

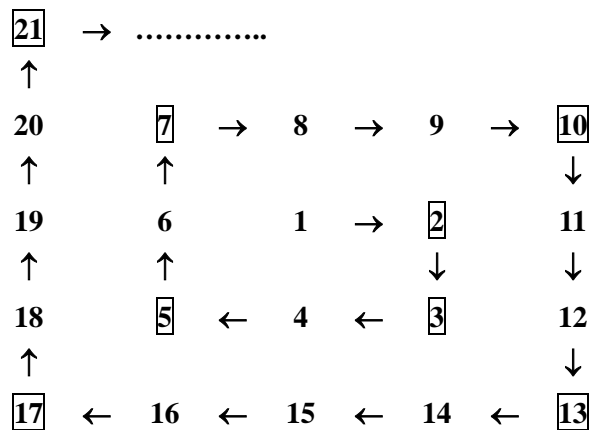


14. 以下為自然數的排列：

若第一個轉角數為“2”、第二個轉角數為“3”、第三個轉角數為“5”、第四個轉角數為“7”，如此類推。求第400個轉角數的值。
(40分)

The natural numbers are arranged in the following pattern:

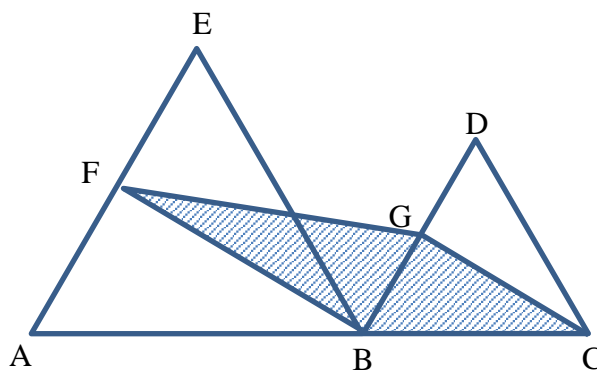
If the 1st turn number is “2”, the 2nd turn number is “3”, the 3rd turn number is “5”, the 4th turn number is “7”, and so on. Find the number of 400th turn.
(40 marks)



15. 圖中為兩個等邊三角形。ABC 為一直線，F 和 G 分別為 AE 及 BD 的中點。已知 $\triangle ABE$ 的面積和 $\triangle BCD$ 的面積分別為 49 cm^2 及 25 cm^2 。求陰影部份的面積。

(42分)

The figure shows two equilateral triangles. ABC is a straight line. F and G are the midpoints of the sides AE and BD respectively. It is given the areas of $\triangle ABE$ and $\triangle BCD$ are 49 cm^2 and 25 cm^2 respectively. Find the area of the shaded region.
(42 marks)



試卷完 END OF PAPER