

第四屆全港小學數學挑戰賽(2017-2018)
The 4th Hong Kong Primary Mathematics Challenge (2017-2018)

初賽（二零一七年十二月二日）
 Semi-Final (2nd December, 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

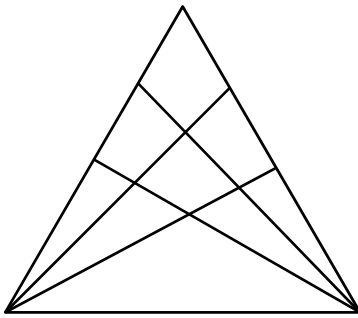
總分：400
Total marks: 400

1. 求 $\frac{1}{1 \times 2} + \frac{1}{2 \times 3} + \frac{1}{3 \times 4} + \dots + \frac{1}{99 \times 100}$ 的值。 (13分)
Find the value of $\frac{1}{1 \times 2} + \frac{1}{2 \times 3} + \frac{1}{3 \times 4} + \dots + \frac{1}{99 \times 100}$. (13 marks)

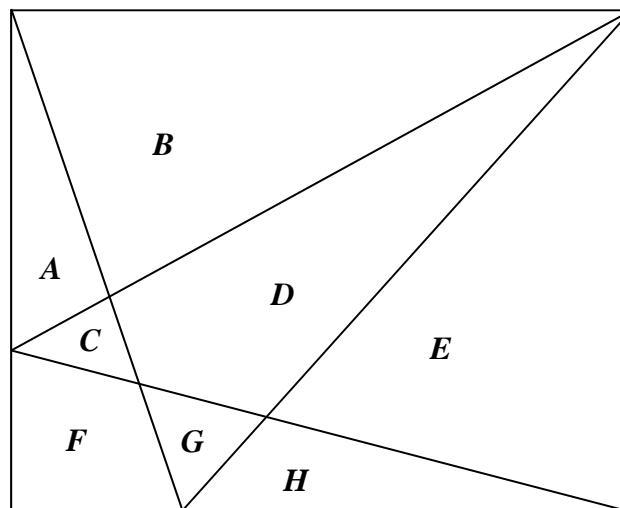
2. 若 $1^3 = 1 \times 1 \times 1$ ，求 $1^3 + 2^3 + 3^3 + \dots + 2017^3$ 的個位數。 (15分)
If $1^3 = 1 \times 1 \times 1$, find the units digit of $1^3 + 2^3 + 3^3 + \dots + 2017^3$. (15 marks)

3. 有一個三位數，減去 5 可被 6 整除，減去 6 可被 7 整除，減去 7 可被 8 整除。求這個三位數的所有可能值。 (17分)
Given a 3-digit number, it is divisible by 6 when 5 is subtracted from it, it is divisible by 7 when 6 is subtracted from it and it is divisible by 8 when 7 is subtracted from it. Find all possible values of this 3-digit number. (17 marks)

4. 求下圖中共有多少個三角形。 (18分)
Find the number of triangles in the following diagram. (18 marks)



5. 圖中，4 條直線將一長方形分為 8 個區域。其中區域 A, F, G 及 H 的面積分別為 56, 42, 12 及 33。求區域 D 的面積。 (19分)
In the figure, a rectangle is divided by 4 straight lines into 8 regions. The areas of regions A, F, G and H are 56, 42, 12 and 33 respectively. Find the area of region D . (19 marks)



6. 已知三個數的最小公倍數是 6，問這三個數有多少個組合？ (20 分)
It is given that the L.C.M. of three numbers is 6, how many combinations of these three numbers are there? (20 marks)
7. 彼得於保齡球館 A 打保齡球，須付 10 元鞋租，而每局收費為 15 元。
西蒙於保齡球館 B 打保齡球，須付 20 元鞋租，而每局收費為 13 元。
最後他們以相同費用，打了相同的局數，問他們分別打了多少局保齡球及付了多少費用？ (23 分)
Peter played bowling at Centre A. He paid \$10 for renting the shoes and \$15 for each game. Simon played at Centre B which charged \$20 for the shoes and \$13 for each game. Finally, they paid the same total amount for the same number of games. How many games did each of them play? How much did each of them spend? (23 marks)
8. 有 120 個學生參加了學校旅行。其中 80 人帶了三文治，64 人帶了水果，12 人甚麼也沒有帶。請找出有多少人同時帶了三文治及水果？ (27 分)
There are 120 students in a school picnic. 80 of them bring sandwiches, 64 of them bring fruit and 12 of them do not bring anything. How many students bring both sandwiches and fruit? (27 marks)
9. 求 1 至 1000 之間所有數的數位之和。
例子：256 之間所有數的數位之和是 $2+5+6 = 13$ 。 (28 分)
Find the sum of all the digits in all the integers from 1 to 1000.
For example, the sum of all the digits of 256 is $2+5+6 = 13$. (28 marks)
10. 若數列 3, 4, 6, 8, 9, 12, 15, 16, ... 是由所有可被 3 或 4 整除的整數組成，求這數列的第 100 項。 (28 分)
If the sequence 3, 4, 6, 8, 9, 12, 15, 16, ... is formed by all integers which are divisible by 3 or 4, find the 100th term of this sequence. (28 marks)
11. 若一本書有 698 頁，問數字 5 出現在頁碼中的次數為多少？ (29 分)
If a book has 698 pages, how many times will the digit 5 be shown on the page number? (29 marks)
12. 已知 $a \times (b + c) = 209$ ，其中 a 、 b 及 c 均為質數。求 $(a + b + c)$ 的值。 (29 分)
It is given that $a \times (b + c) = 209$, where a , b , and c are prime numbers.
Find the value of $(a + b + c)$. (29 marks)
13. 在 1 至 280 中 (包括 1 和 280)，有多少個數不能被 2、5 或 7 整除？ (31 分)
From 1 to 280 (including 1 and 280), how many numbers are not divisible by 2, 5 or 7? (31 marks)

14. 已知
- $$Y + Y = A$$
- $$Y - Y = B$$
- $$Y \times Y = C$$
- $$Y \div Y = D$$
- 若 $A + B + C + D = 121$ ，求 Y 。

(31 分)

It is given that

$$Y + Y = A$$

$$Y - Y = B$$

$$Y \times Y = C$$

$$Y \div Y = D$$

If $A + B + C + D = 121$, find Y .

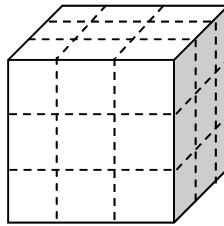
(31 marks)

15. 小明將一立方體的表面涂上漆油，然後沿著虛線切成若干個較小的立方體(如圖所示)。有多少個小立方體
- (i) 只有一面有漆油？
- (ii) 只有兩面有漆油？
- (iii) 只有三面有漆油？

(33 分)

Ming painted the surface of a cube and then cut it into some smaller cubes (as shown in the figure). How many small cubes have paint

- (i) with only one face?
- (ii) with only two faces?
- (iii) with only three faces?



(33 marks)

16. 兩個相同整數之積稱為平方數。

例如 9 是平方數，因為 $9 = 3 \times 3$ 。

把 0 至 9 這十個數，分別填入圖中的空格內，使相鄰兩數之積加 1 成為平方數。

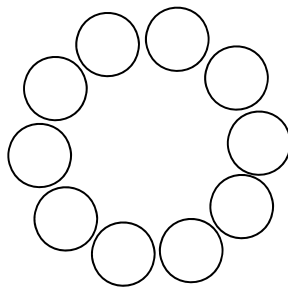
(39 分)

The product of two same integers is called a *square number*.

For example 9 is a square number, as $9 = 3 \times 3$.

Use all the ten numbers from 0 to 9 into each of the spaces in the figure so that for any two neighbouring numbers, the sum of their product plus 1 is a square number.

(39 marks)



試卷完 END OF PAPER