

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

決賽 (二零一八年三月二十四日)
Final (24th March, 2018)

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. 計算 $1 - \frac{1}{10} - \frac{1}{10^2} - \frac{1}{10^3} - \frac{1}{10^4} - \frac{1}{10^5}$ 。 (10分)

Evaluate $1 - \frac{1}{10} - \frac{1}{10^2} - \frac{1}{10^3} - \frac{1}{10^4} - \frac{1}{10^5}$. (10 marks)

2. $\underbrace{888\dots888}_{2017}$ 除以 3，餘數是多少？ (12分)

What is the remainder when $\underbrace{888\dots888}_{2017}$ is divided by 3? (12 marks)

3. 在 2 至 120，共寫下多少個「1」字？ (18分)

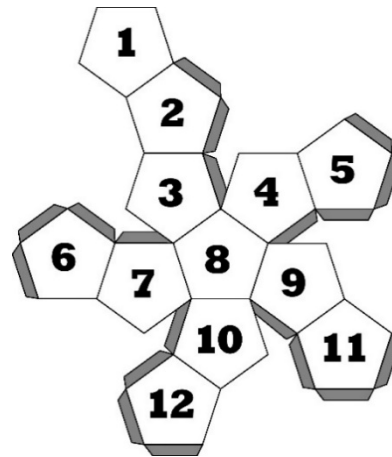
From 2 to 120, how many "1" are there? (18 marks)

4. 圖中是一個正十二面體的摺紙圖樣。

- (a) 「5」的背面是什麼數字？
(b) 求與「1」相鄰的數字之和。

The figure is a net of a regular dodecahedron.

- (a) Which number is opposite to "5"?
(b) Find the sum of all numbers adjacent to "1".



(20分)

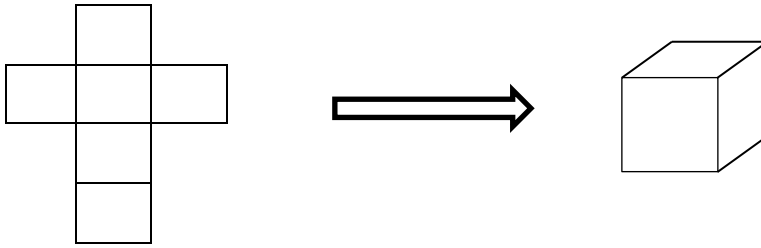
(20 marks)

5. 在以下地圖中，若你只可由A點往下走向B點，共有多少條不同的路綫？ (21分)

The diagram below shows a map. If you are only allowed to move downwards from point A to point B, how many different ways are there? (21 marks)



6.

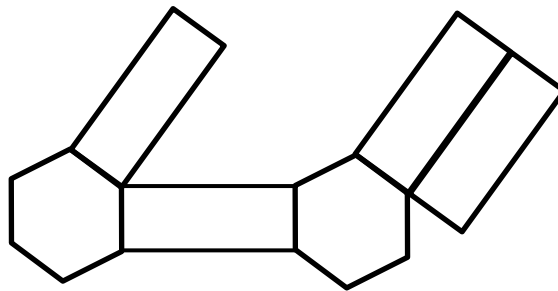


上圖顯示一個摺紙圖樣能摺出一個正方體。完成下圖中的紙樣，使其能摺出一個六角柱。

(23 分)

The above figure shows a net can be folded into a cube. Complete the net below, so that it can be folded into a hexagonal prism.

(23 marks)



7. $\left(1 + \frac{19}{92}\right) + \left(1 + \frac{19}{92} \times 2\right) + \left(1 + \frac{19}{92} \times 3\right) + \dots + \left(1 + \frac{19}{92} \times 10\right) + \left(1 + \frac{19}{92} \times 11\right) = x$

求 x 最接近的整數。

(24 分)

Find the integer which is closest to x .

(24 marks)

8. 某小學 6 年級學生共有 120 人，65 人喜歡數學科，58 人喜歡英文科，53 人喜歡中文科。而喜歡數學科及中文科的有 21 人，喜歡數學科及英文科的有 19 人，喜歡中文科及英文科的有 25 人。問同時喜歡三科的人有多少？

(25 分)

In a school, there are 120 primary 6 students, 65 of them like Mathematics, 58 of them like English, 53 of them like Chinese. There are 21 students like both Mathematics and Chinese, 19 students like both Mathematics and English, 25 students like both Chinese and English. How many students like all the three subjects?

(25 marks)

9. 若正整數 x 、 y 能滿足方程 $\frac{3}{x} + \frac{2}{y} = 1$ ，求 $x + y$ 的兩個可能數值。

(26 分)

If positive integers x, y satisfy the equation $\frac{3}{x} + \frac{2}{y} = 1$,

find two possible values of $x + y$.

(26 marks)

10. 已知一個五位數是 $42x6y$ ，若這個數能被 9 整除，試寫出 $x + y$ 的兩個可能數值。

(26 分)

Given a five digits number $42x6y$. If this number is divisible by 9, write down the two possible values of $x + y$.

(26 marks)

11. 求以下算式中各英文字母可代表的數字(0-9)。每個英文字母均代表不同的數字。(28分)

Find the digits (0-9) represented by the different letters in the following calculation.

Each letter represents a different number.

(28 marks)

$$\begin{array}{r} A B B C \\ \times \quad C \\ \hline A D B C B \end{array}$$

12. 兩個面積為 2018 cm^2 的長方形，現在把它們拼成一個大長方形。求大長方形周界的最大可能值。(長方形的邊長均為整數 cm 。)(29分)

There are 2 rectangles and the area of each of them is 2018 cm^2 . Now, join them together to form a large rectangle. Find the maximum possible value of the perimeter of the large rectangle. (All the length of the sides of rectangles are integer in cm .)

(29 marks)

13. 已知一個長方體的長、闊和高為三個連續數，該長方體的體積為 15600 cm^3 。

(a) 求該長方體的最短的邊長。

(b) 若把長方體的表面塗上價錢為每 cm^2 \$ 0.5 的油漆，求油漆的成本。(32分)

It is known that the length, width and height of a cuboid are three consecutive numbers. The volume of the cuboid is 15600 cm^3 .

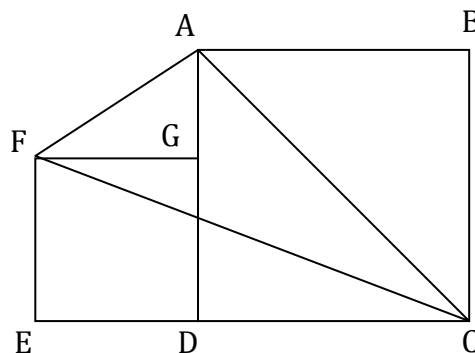
(a) Find the length of the shortest side of the cuboid.

(b) If the cuboid is painted by painting oil with the price of \$0.5 per cm^2 , find the total cost of the painting oil.

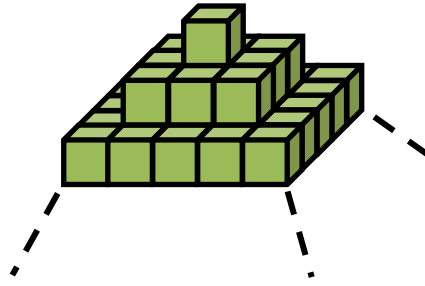
(32 marks)

14. 圖中， $ABCD$ 及 $DEFG$ 是正方形。若 $AB = 20\text{cm}$ ，求 $\triangle ACF$ 的面積。(33分)

In the figure, $ABCD$ and $DEFG$ are squares. If $AB = 20\text{cm}$, find the area of $\triangle ACF$. (33 marks)



15.



一積木山由多件邊長 1cm 之正方體堆成，積木山最高的第一層有 1×1 件正方體、第二層有 3×3 件、第三層有 5×5 件，如此類推。假設積木山共有 10660 件正方體，求積木山的高度。 (35 分)

A brick hill is made by a number of cubes with length 1 cm. The first layer (top layer) of the hill contains 1×1 piece of cube, the second layer contains 3×3 pieces of cubes, the third layer contains 5×5 pieces of cubes and so on. If the hill contains 10660 cubes, find the height of the hill. (35 marks)

16. 在早上 8 時開始，陳先生以時速 16 km 的速度由城市 A 進行跑步練習，他的跑步路線是來回城市 A 與城市 B，兩城市相距 28 km。到達城市 B 後，陳先生休息 30 分鐘，然後跑回城市 A。李小姐同樣由城市 A 跑步去城市 B，她是在早上 8 時 15 分開始以時速 4 km 跑步，問陳先生與李小姐在什麼時候第一次相遇? (38 分)

Mr. Chan starts his running practice at 8:00 a.m. at 16 km/hour from town A. He runs along a track between town A and town B, which is 28 km apart. Once Mr. Chan reaches town B, he takes a 30 minutes break, then he runs back to town A. Miss Lee starts running from town A to town B at 8:15 a.m. at 4 km/hour. When will they first meet each other? (38 marks)

試卷完 END OF PAPER