

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 個人項目 試卷
Primary 6 Individual 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：100
Total marks: 100

1. 以下為三個循環小數的例子：

$$0.\dot{1} = 0.111111\dots, \quad 0.45\dot{2}\dot{3} = 0.45232323\dots, \quad 0.45\dot{2}7\dot{3} = 0.45273273273\dots$$

在循環小數 $0.201856\dot{7}$ 上再添加一個循環符號“ \cdot ”，使這個循環小數達至最小，應將符號加在哪個數字上？ (2 分)

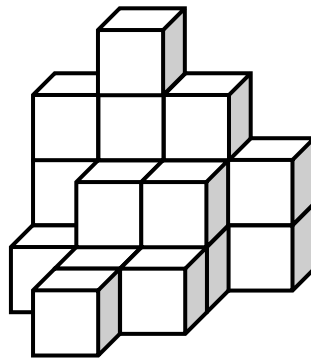
The following numbers are the examples of three recurring decimals,

$$0.\dot{1} = 0.111111\dots, \quad 0.45\dot{2}\dot{3} = 0.45232323\dots, \quad 0.45\dot{2}7\dot{3} = 0.45273273273\dots$$

Add a recurring notational “ \cdot ” on the recurring decimal $0.201856\dot{7}$ such that the number can attain its minimum value. Which number should we put the recurring notation on? (2 marks)

2. 171819 除本身之外，最大的因數是多少？ (2 分)
Besides itself, what is the greatest factor of 171819? (2 marks)

3. 圖中立體是由二十個相同的正方體組成，若該立體的總表面面積是 60cm^2 。求立體的體積。 (3 分)
The solid in the figure is composed of twenty identical cubes. If the total surface area of the solid is 60cm^2 , find the volume of the solid. (3 marks)



4. 一個長、闊和高均為整數的長方體的體積是 1320 cm^3 。求這個長方體的最小可能總表面面積。 (3 分)
The volume of a cuboid which length, width and height are all integers is 1320cm^3 . Find the smallest possible total surface area of this cuboid. (3 marks)

5. 求 $\underbrace{2018 \times 2018 \times \dots \times 2018 \times 2018}_{2018 \text{ 次}}$ 的個位數字。 (4 分)

Find the units digit of $\underbrace{2018 \times 2018 \times \dots \times 2018 \times 2018}_{2018 \text{ times}}$. (4 marks)

6. 定義 $A*B@C = \frac{A-C}{B}$ 。例: $8*4@2 = \frac{8-2}{4} = 3$

若 $6*4@3 + 4*3@2 + 14*12@1 = \frac{m}{n}$ ，求 $m+n$ 的最小值，其中 m 和 n 為

正整數。

(4 分)

Define $A*B@C = \frac{A-C}{B}$. Example: $8*4@2 = \frac{8-2}{4} = 3$

If $6*4@3 + 4*3@2 + 14*12@1 = \frac{m}{n}$, find the least value of $m+n$, where m

and n are positive integers.

(4 marks)

7. 一個正方形沿虛線方向被分成六個大小、形狀相等的長方形。若每個小長方形的周界是 28cm，求正方形的周界。

(4 分)

A square is divided into six rectangles with the same sizes and shapes along the direction of the dotted line. If the perimeter of each small rectangle is 28cm, find the perimeter of the square.

(4 marks)



8. 根據下面老師的三句話，

(1) A 老師說：「我比 C 老師的年紀小。」

(2) B 老師說：「我比 A 老師的年紀大。」

(3) C 老師說：「我比 B 老師的年紀小。」

因此年紀最大的是 () 老師，最小的是 () 老師。

(4 分)

According to the following teachers' statements,

(1) "I'm younger than Teacher C.", said Teacher A.

(2) "I'm older than Teacher A.", said Teacher B.

(3) "I'm younger than Teacher B.", said Teacher C.

Thus, Miss () is the oldest teacher and Miss () is the youngest teacher. (4 marks)

9. 求 1 至 1000 (包括 1 及 1000) 之內不能被 2 或 3 整除的整數的數目。

(4 分)

Find the number of integers between 1 and 1000 (included 1 and 1000) which cannot be divided by either 2 or 3.

(4 marks)

10. 若在下面括號中填上一個分母小於 10 的分數，問共有多少個分數？
(所有分數約至最簡) (5 分)
If a fraction, whose denominator is less than 10, is filled in the bracket, how many fractions are there? (All fraction are in the simplest forms) (5 marks)
- $$\frac{3}{10} < (\quad) < \frac{1}{2}$$
11. 一單工程，A 公司需 100 天完成，B 公司需 150 天完成。若 A 和 B 合作做 50 天後，剩下工程才交給 B 公司獨自完成，問 B 公司還需工作多少天？ (5 分)
There is a project. Company A needs 100 days to finish. Company B needs 150 days to finish. If A and B do it in 50 days together, then the rest of the project is finished by B only, how many more days does company B need to finish the project? (5 marks)
12. 求下列數式中的最後 3 個位的數字。 (5 分)
Find the value of the last three digits in the following expression. (5 marks)
- $$4 + 44 + 444 + \cdots + \underbrace{444 \cdots 444}_{20}$$
13. A、B 之和是 854，A 最後的一個數字是 7，若把 7 去掉，就與 B 相等，求 A 的值。 (5 分)
The sum of A and B is 854. The last digit of A is 7. If 7 is deleted, A is equal to B. Find the value of A. (5 marks)
14. 計算 $8888 \times 8888 \div (1+2+3+4+5+6+7+8+7+6+5+4+3+2+1)$ 的值。 (5 分)
Evaluate $8888 \times 8888 \div (1+2+3+4+5+6+7+8+7+6+5+4+3+2+1)$. (5 marks)
15. 求數列 0, 3, 8, 15, 24, ..., 99 的總和。 (6 分)
Find the sum of the sequence 0, 3, 8, 15, 24, ..., 99. (6 marks)
16. 嘉雯看書，第一天看了全書的一半多 5 頁，第二天看餘下的一半少 10 頁，第三天看了 50 頁後還剩 55 頁，問這本書有多少頁？ (6 分)
Carmen read a book. She read half of the book and 5 more pages on the first day. She read 10 less pages than a half of the remaining pages on the second day. There were 55 pages left after she read 50 pages on the third day. How many pages of the book are there? (6 marks)
17. 一盒長方體包裝的糖果，它的長是 9 cm，闊是 5 cm，高是 2 cm。把 12 盒糖果包裝在一起形成一個大長方體，稱為禮盒裝糖果。求禮盒裝糖果的最少可能的表面面積。 (7 分)
For a cuboid box of candies, its length is 9 cm, its width is 5 cm and its height is 2 cm. 12 boxes of the candies are packed to form a larger cuboid as the gift package. Find the least possible total surface area of the gift package. (7 marks)

18. 用 2 條直線，最多只可形成一個交點；用 3 條直線，最多只可形成 3 個交點。用 19 條直線，最多只可形成多少個交點？ (8 分)

Two straight lines can intersect 1 point at most; 3 straight lines can intersect 3 points at most. How many points can 19 straight lines intersect at most? (8 marks)

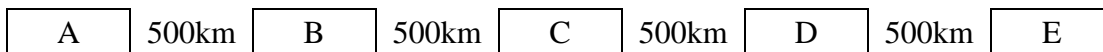
19. 下圖顯示五個城市，A、B、C、D 和 E 城中分別有 1000kg、2000kg、3000kg、4000kg 和 5000kg 緊急物資。城與城之距離為 500km。如要把物資集中在一個城中，而當中的運輸費以每 100kg 計，每 1km 收費 \$2，

- (a) 問集中在那一個城市運費最便宜？
 (b) 最低運費是多少？ (9 分)

The following figure shows city A, B, C, D and E, where are 1000kg, 2000kg, 3000kg, 4000kg and 5000kg emergency goods in each city respectively.

The distance between each two cities is 500km. If all the goods are collected in one city, while the transportation fee is \$2 per 100kg per 1km,

- (a) which city should be selected for the lowest transportation fee?
 (b) how much is the lowest transportation fee? (9 marks)



20. 在下面方格中填上數字 1, 2, 3, 4 和 8，每個數字只能出現一次。 (9 分)

Fill the numbers 1, 2, 3, 4, and 8 in the following boxes, each of the numbers appears once only. (9 marks)

$$5796 \div \boxed{} \boxed{} = \boxed{} \boxed{} \boxed{}$$

試卷完 END OF PAPER