

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

**初賽 (二零一六年十二月三日)**  
**Semi-Final (3<sup>rd</sup> December, 2016)**

**小五組                      個人項目                      試卷**  
**Primary 5                      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

- 如果 100,000 秒相等於  $A$  小時  $B$  分鐘  $C$  秒，求  $A, B, C$  的值。 (2 分)  
If 100,000 seconds equal to  $A$  hours  $B$  minutes and  $C$  seconds, find the values of  $A, B$  and  $C$ . (2 marks)
- 求  $2017^{2017}$  的個位數。 (3 分)  
Find the units digit of  $2017^{2017}$ . (3 marks)
- 求  $101+102+103+\dots+199+200$  的值。 (2 分)  
Find the value of  $101+102+103+\dots+199+200$ . (2 marks)
- 計算  $(2^6 \times 6^5) \div 12^4$ 。 (3 分)  
Evaluate  $(2^6 \times 6^5) \div 12^4$ . (3 marks)
- 如果  $a$  和  $b$  是質數，同時  $c = a \times b$  及  $\frac{1}{a} + \frac{1}{c} = \frac{2}{b}$ ，求  $a + b + c$  最小的值。 (4 分)  
If  $a$  and  $b$  are prime numbers,  $c = a \times b$  and  $\frac{1}{a} + \frac{1}{c} = \frac{2}{b}$ , find the least value of  $a + b + c$ . (4 marks)
- 50 至 120 之間有多少個質數？ (4 分)  
How many prime numbers are there between 50 to 120? (4 marks)
- 把以下 6 個數分成兩組，每組 3 個數，且每組的積相等。 (4 分)  
Divide the following six numbers into 2 groups so that each group has 3 numbers and the products of each group are equal. (4 marks)

33, 34, 38, 57, 77, 119

- 如果 2016 年 12 月 3 日是星期六，則 2017 年 8 月 3 日是星期幾？ (4 分)  
If the 3rd of December in 2016 is Saturday, what is the day of the week of the 3<sup>rd</sup> of August in 2017? (4 marks)
- 將數字 1 至 9 分別填入以下方格內，使等式成立。 (5 分)  
Put the numbers 1 to 9 in the following boxes to make the expression valid. (5 marks)

$$\frac{\square}{\square\square} + \frac{\square}{\square\square} + \frac{\square}{\square\square} = 1$$

10. 約翰與爸爸和媽媽今年的年齡分別是 9 歲、36 歲和 34 歲。  
求多少年後，爸爸和媽媽年齡的總和是約翰的 4 倍？ (5 分)  
This year, John, his father and his mother are 9, 36 and 34 years old respectively.  
After how many years will the sum of the ages of John's father and mother be 4 times that of John's age? (5 marks)

11.  $a192b$  是一個能被 18 整除的五位數，其中  $a$  比  $b$  大 3，求  $a + b$  的值。 (5 分)  
A 5-digit number  $a192b$  is divisible by 18, where  $a$  is greater than  $b$  by 3, find the value of  $a + b$ . (5 marks)

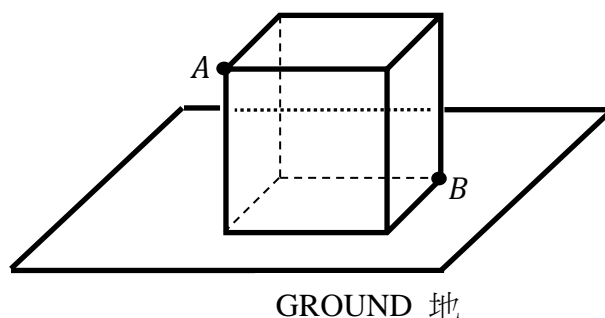
12. 將數字 1、2、3、4、5、7、8、9 填入以下等式的左邊，並將數字 1、2、3、4、5、6、7、8、9 填入以下等式的右邊，使等式成立。 (6 分)  
Put the numbers 1, 2, 3, 4, 5, 7, 8 and 9 on left hand side of the following expression, and put 1, 2, 3, 4, 5, 6, 7, 8 and 9 on the right hand side to make the expression valid. (6 marks)

$$\boxed{\phantom{0}}\boxed{\phantom{0}}\boxed{\phantom{0}}\boxed{\phantom{0}}\boxed{\phantom{0}}\boxed{\phantom{0}}\boxed{\phantom{0}}\boxed{\phantom{0}} \times 6 = \boxed{\phantom{0}}\boxed{\phantom{0}}\boxed{\phantom{0}}\boxed{\phantom{0}}\boxed{\phantom{0}}\boxed{\phantom{0}}\boxed{\phantom{0}}\boxed{\phantom{0}}\boxed{\phantom{0}}\boxed{\phantom{0}}$$

13. 如果  $a \times b = 33$ ， $b \times c = 187$ ， $c \times a = 51$ ，而  $a$ 、 $b$ 、 $c$  都是正整數，求  $a + b + c$  的值。 (5 分)  
If  $a \times b = 33$ ， $b \times c = 187$ ， $c \times a = 51$  where  $a$ ,  $b$  and  $c$  are positive integers, Find the value of  $a + b + c$ . (5 marks)

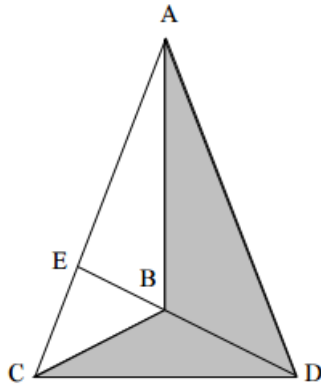
14. 一個長方體的前、後、上、下四個面的面積之和是  $154 \text{ cm}^2$ ，長、闊、高都是質數，求這個長方體的體積是多少  $\text{cm}^3$ ？ (5 分)  
In a cuboid, the total area of the top, bottom, front and back faces is  $154 \text{ cm}^2$ , the length, width and the height of the cuboid are prime numbers, what is the volume of the cuboid in  $\text{cm}^3$ ? (5 marks)

15. 如圖所示，一隻螞蟻從實心正方體的頂點 A 出發，沿正方體的表面爬行至頂點 B。若螞蟻選擇最短距離，它共有多少種不同的路線？ (6 分)  
In the figure, an ant crawls from vertex A to vertex B on the surface of the cube. If the distance crawled by the ant is the shortest, find the number of different ways it crawls. (6 marks)



16. 從 6 條長度分別為 3 cm、4 cm、5 cm、6 cm、7 cm、8 cm 的線段中，任意取 3 條組成三角形，能組成多少個不同的三角形？ (6 分)  
 There are 6 strings in 3 cm, 4 cm, 5 cm, 6 cm, 7 cm and 8 cm. Choose any 3 strings to form a triangle. How many different triangles can be formed? (6 marks)

17. 下圖中， $EBD$  為一直線， $\frac{EB}{BD} = \frac{1}{3}$  且陰影部分的面積為  $63 \text{ cm}^2$ 。求  $\triangle ADC$  的面積。 (7 分)  
 In the following figure,  $EBD$  is a straight line,  $\frac{EB}{BD} = \frac{1}{3}$  and the area of the shaded part is  $63 \text{ cm}^2$ . Find the area of  $\triangle ADC$ . (7 marks)



18. 現有九個編號從 1 至 9 的白球，把其中兩個塗成紅色且兩球編號之差大於 3。求有多少種不同的塗法？ (7 分)  
 There are nine balls marked from 1 to 9. Two of them will be painted in red and the difference between the 2 balls must be greater than 3. How many different ways of painting are there for the balls? (7 marks)

19. 求以下數列中，A，B 的值是多少。 (8 分)  
 Find the values of A and B in the following sequence. (8 marks)

16, 48, 32, 40, 36, A, B, .....

20. 求 2016 中有多少個因數？ (9 分)  
 Find the number of factors of 2016. (9 marks)

試卷完 END OF PAPER