

**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	組別項目	試卷
Primary 5	Group Event	Question Paper

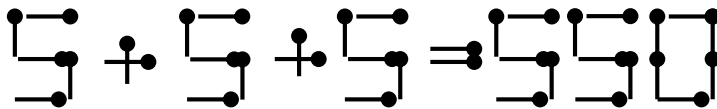
**參賽者須知 Instructions to Contestants**

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

- 三位數 5AB 是 18 和 21 的公倍數，求 A + B 的值。  
A 3-digit number 5AB is a common multiple of 18 and 21.  
Find the value of A + B. (13 分)  
(13 marks)
- 約翰閱讀的時間是湯姆的四分之一。  
湯姆只讀了相等於莎夏五分之二的時間；莎夏的閱讀時間是麥可的兩倍。  
如果麥可讀了共 18 小時的書，那麼約翰讀了多久的書？ (16 分)  
John read a quarter of the time that Tom spent on reading. Tom read only two-fifth of  
the time that Sasha spent on reading. Sasha read twice as long as Mike did.  
If Mike spent 18 hours for reading, how long did John read? (16 marks)
- 求 215600 的所有質因數之和。  
Find the sum of all the prime factors of 215600. (16 分)  
(16 marks)
- 母女現在年齡的和是 66，三年前，母親年齡為女兒的 3 倍，  
求母親現在的年齡。  
The sum of the present ages of mother and daughter is 66. Three years ago,  
the age of the mother was three times that of her daughter,  
find the age of the mother now. (18 分)  
(18 marks)
- 在以下圖中加多一枝火柴，使等式成正。  
In the figure, add one more match to make the left hand side equal to right  
hand side of the expression. (18 分)  
(18 marks)



- 美絲畫了 8 條不平行的直線在一張紙上，這 8 條直線最多能有多少  
個相交點？ (20 分)  
Macy draws 8 non-parallel straight lines on a piece of paper.  
Find the maximum number of intersection points that those lines can make. (20 marks)
- 將數字'4' 使用四次，並用運算符號(+、-、×、÷) 及括號()，  
組成如首兩行的等式。  
Using four '4' with the symbols (+, -, ×, ÷) and the bracket ( ) to make the  
equations as shown in the first two lines. (24 分)  
(24 marks)

$$1 = 44 \div 44$$

$$2 = 4 \div 4 + 4 \div 4$$

$$3 = ?$$

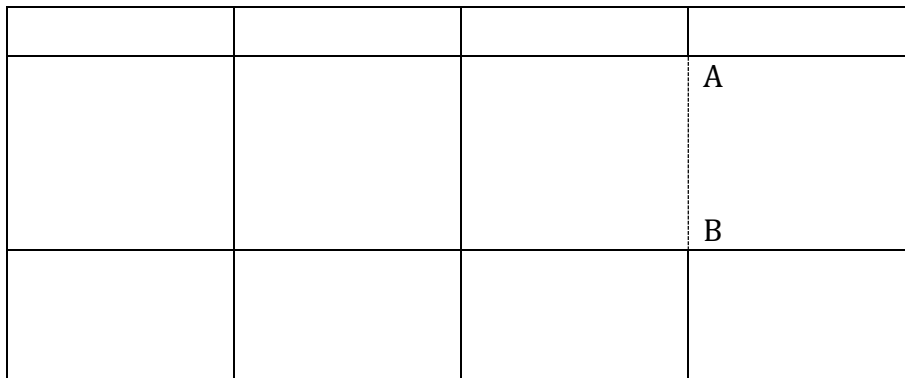
$$4 = ?$$

$$5 = ?$$

$$6 = ?$$

8. 某公司有 300 多名員工，公司嘗試安排座位開員工大會。  
 若每行擺放 16 張椅子，最後一行將會有 2 個空位。  
 若每行擺放 18 張椅子，最後一行將會有 16 個空位。  
 若每行擺放 14 張椅子，最後一行將會有 8 個空位。  
 請問該公司最少有多少名員工？ (24 分)  
 There are more than 300 staff in a company. The company try to arrange several rows of seats for a staff meeting.  
 If there are 16 seats in each row, the last row will have 2 empty seats.  
 If there are 18 seats in each row, there will be 16 seats empty in the last row.  
 If there are 14 seats in each row, there will be 8 seats empty in the last row.  
 At least how many staff are there in the company? (24 marks)
9. 把一個長 60 厘米，闊 24 厘米的長方形剪成面積相同、長度為整數的正方形，若在沒有剩餘的情況下，最少可以剪得多少個正方形？ (24 分)  
 A 60 cm × 24 cm rectangle is being cut into squares of which the area of each square is the same and the length is an integer. If there is nothing to be left, what is the least number of squares that can be cut? (24 marks)
10. 約翰與彼得是同班同學。該班的學生人數介於 30 和 50 之間，且每人的出生日期都不相同。  
 在該班年歲比約翰大的同學人數和比約翰小的人數是一樣；  
 而該班年歲比彼得大的同學人數是比彼得小的人數的 4 倍。  
 求該班的學生人數的所有可能性。 (25 分)  
 John and Peter are students of the same class. The number of students in this class is between 30 and 50 and all the students were born on different dates.  
 In this class, the number of students older than John is the same as that younger than John; while the number of students older than Peter is 4 times of that younger than Peter.  
 Find all possible numbers of students in this class. (25 marks)
11. 有一個長方形，若它的長和闊同時增加 8 cm，則其面積增加 120 cm<sup>2</sup>。  
 求長方形原來的周界。 (27 分)  
 If the length and width of a rectangle are both increased by 8 cm, the area will be increased by 120 cm<sup>2</sup>.  
 Find the perimeter of the original rectangle. (27 marks)
12. 陳先生同時燃點兩支長度相同的蠟燭。  
 第一支蠟燭需 6 小時才完全燒完，而第二支則只需 2 小時便燒完。  
 假設兩支蠟燭皆以固定的速率燃燒，問燃燒多久（以分鐘表示）才能令第一支蠟燭的剩餘長度剛好是第二支的兩倍？ (30 分)  
 Two candles of the same height were lit by Mr. Chan at the same time.  
 The first candle took 6 hours to burn completely while the second candle took 2 hours. Assume each candle burns at a constant rate,  
 how long does it take (in minutes) for the first candle to be twice the height of the second candle? (30 marks)

13. 下圖共有多少個不包括線段 AB 的長方形？ (35 分)  
 How many rectangles are there in the following figure that they do not contain the line segment AB? (35 marks)



14. 某長方體盒子的體積是  $296 \text{ cm}^3$ ，該盒子的長、闊、高都是整數。  
 這個盒子最小的總表面面積是多少？ (35 分)  
 The volume of a rectangular box is  $296 \text{ cm}^3$ . The length, width and height of the box are integers. Find the least total surface area of the box. (35 marks)

15. 約翰能單獨用 50 天完成一件工作，彼得需要單獨用 70 天完成同樣的工作。  
 如果約翰做了那件工作一天後，由彼得接替做第二天，再由約翰接替做第三天，兩人如此輪流交替工作，請問完成該項工作需要多少天？ (35 分)  
 John can complete a job by himself in 50 days, Peter can complete the job by Himself in 70 days. If John do the job in the first day then Peter do the job in the second day and then back to John to do job in the third day and so on, how many days does it take to finish the job? (35 marks)

16. 已知  $1^2 + 2^2 + 3^2 + \dots + n^2 = \frac{n \times (n+1) \times (2n+1)}{6}$ ，其中  $n$  是一個自然數。  
 (a) 求  $1 + 4 + 9 + \dots + 121$  的值。  
 (b) 求  $2^2 + 4^2 + 6^2 + \dots + 20^2$  的值。 (40 分)

Given that  $1^2 + 2^2 + 3^2 + \dots + n^2 = \frac{n \times (n+1) \times (2n+1)}{6}$ ,

where  $n$  is a natural number.

- (a) Find the value of  $1 + 4 + 9 + \dots + 121$ .  
 (b) Find the value of  $2^2 + 4^2 + 6^2 + \dots + 20^2$ . (40 marks)