

第五屆全港小學數學挑戰賽(2018-2019)
The 5th Hong Kong Primary Mathematics Challenge (2018-2019)

初賽 (二零一八年十二月一日)
 Semi-Final (1st December, 2018)

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

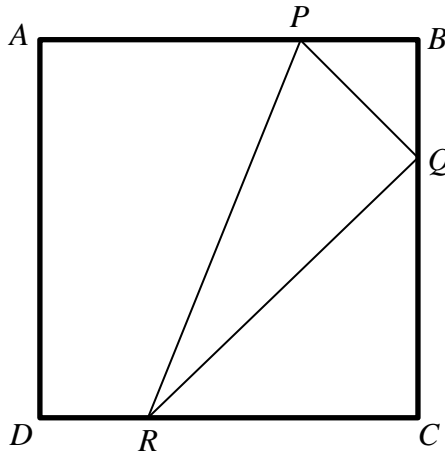
總分：400

Total marks: 400

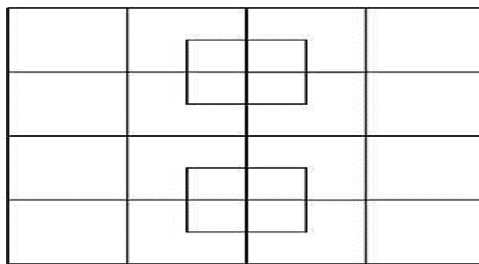
1. 7^{2019} 的個位數是多少？ (15 分)
 What is the unit digit of 7^{2019} ? (15 marks)
2. 若兩個正整數之和是 121，它們之積的最大值是多少？ (17 分)
 If the sum of two positive integers is 121, what is the greatest value of their product? (17 marks)
3. (a) 把「+」或「-」號填入以下算式中的 \square 內，使算式成立。 (16 分)
 (b) 當填入最少的「-」號使算式成立時，「-」號需填在哪些數字之前？ (5 分)
 (a) Fill in the following \square with the operation signs “+” or “-” such that the equation can be balanced. (16 marks)
 (b) When the least number of “-” signs was/were used, which number(s) should the “-” sign be inserted in front of it/them? (5 marks)
- $$1 \square 2 \square 3 \square 4 \square 5 \square 6 \square 7 \square 8 \square 9 = 1$$
4. 已知 $40-n$ 及 $40+n$ 皆是質數，當中 n 是正整數。問 n 有多少個可能值？ (21 分)
 It is given that $40-n$ and $40+n$ are prime numbers, where n is a positive integer.
 How many possible values of n ? (21 marks)
5. 有五個不同的正數。若將它們每兩個相加，所得的和如下：
 3, 6, 7, 8, 9, 11, 12, 12, 15, 17
 求這五個數。 (23 分)
 There are five different positive numbers. When every two of them are added, the sums are as follows:
 3, 6, 7, 8, 9, 11, 12, 12, 15, 17
 Find these five numbers. (23 marks)
6. 已知 $a \oplus b = 3a - b$ 。若 $2 \oplus (5 \oplus x) = 1$ ，求 x 的值。 (24 分)
 It is given that $a \oplus b = 3a - b$. If $2 \oplus (5 \oplus x) = 1$, find the value of x . (24 marks)
7. 已知 a 、 b 、 c 為正整數，且 $a+b=2011$ ， $c-a=2010$ 及 $a < b$ 。
 求 $a+b+c$ 的最大值。 (24 分)
 It is given that a, b and c are positive integers, $a+b=2011$, $c-a=2010$ and $a < b$. Find the greatest value of $a+b+c$. (24 marks)
8. 利用 0, 3, 5, 6 或 8 可以組成多少個 3 位偶數？(不可重複使用數字) (25 分)
 Without repeating the digits, how many 3-digit even numbers can be formed by using 0, 3, 5, 6 or 8? (25 marks)

9. 在圖中， $ABCD$ 為一正方形。已知 $DR = 1\text{cm}$ ， $RC = 3\text{cm}$ ， $BQ = 1\text{cm}$ 及三角形 PQR 的面積為 5cm^2 。求 AP 的長度。 (25 分)

In the figure, $ABCD$ is a square. It is given that $DR = 1\text{cm}$, $RC = 3\text{cm}$, $BQ = 1\text{cm}$ and the area of the triangle PQR is 5cm^2 . Find the length of AP . (25 marks)

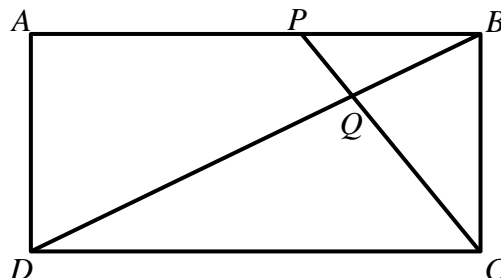


10. 圖中有多少個長方形?
How many rectangles are there in the figure below? (26 分) (26 marks)



11. 圖中 $ABCD$ 是一個長方形。如果 $DQ = 2BQ$ ， $CQ = 2PQ$ 及 $\triangle BCQ$ 面積為 8 平方單位，求四邊形 $APQD$ 面積。 (27 分)

In the figure, $ABCD$ is a rectangle. If $DQ = 2BQ$, $CQ = 2PQ$ and the area of $\triangle BCQ$ is 8 square units, find the area of quadrilateral $APQD$. (27 marks)



12. A 、 B 、 C 和 D 四位學生在操場集隊，他們排成一行。如果 A 及 D 二人必定要排在一起，問有多少種不同排隊方法? (27 分)

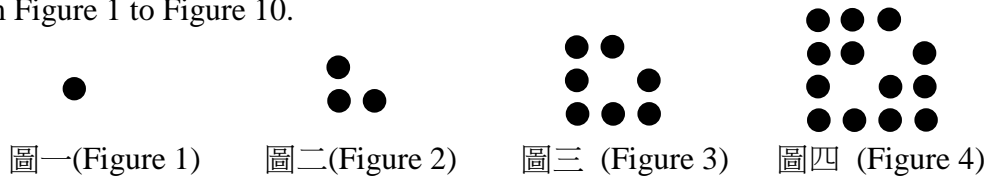
Four students A , B , C and D are lining up in the playground. They line up in a row. If A and D must stand next to each other, how many different ways can they line up in a row? (27 marks)

13. 某所學校內，五年級學生共有 200 位，每位學生至少會說一種外語。如果會說法文的有 167 人，會說德文的有 145 人，會說西班牙文的有 158 人，問最多能有多少學生會說三種外語？ (29 分)

In a school, there are 200 students in Grade 5, each student can speak at least one foreign language. If 167 students can speak French, 145 students can speak German and 158 students can speak Spanish, at most how many students can speak all three foreign languages? (29 marks)

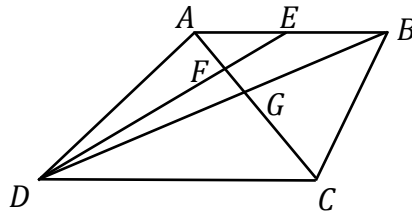
14. 參考附圖，根據規律，求圖一至圖十圓點的總數量。 (31 分)

According to the pattern of the following figures, find the total number of dots from Figure 1 to Figure 10. (31 marks)



15. 圖中是一個梯形 $ABCD$ 。 $AB : DC = 2 : 3$ 及 E 是 AB 的中間點。直線 DE 和 DB 分別和 AC 相交於 F 及 G 。請找出 $AF : FG : GC$ 的比例。 (32 分)

The figure shows a trapezium $ABCD$, where $AB : DC = 2 : 3$. E is the mid-point of AB . Straight lines DE and DB meet AC at F and G respectively. Find the ratio of $AF : FG : GC$. (32 marks)



16. 一水龍頭注滿一個水缸需時 30 分鐘。水缸底有一小洞。如水缸注滿水，75 分鐘後，水便能從小洞排空。現在水缸是空的。若水缸現在同時以水龍頭注水及用小洞排放水，問需要多少分鐘才能把該水缸注滿水？ (33 分)

An empty tank can be filled up with water in 30 minutes by a tap. There is a small hole at the bottom of the tank. If the tank is full of water, all water will be drained in 75 minutes through the small hole. Now the tank is empty. If the tank is filled with water by a tap and water is drained through the small hole at the same time, how many minutes should it take to fill up the tank? (33 marks)

試卷完 END OF PAPER