

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

**決賽 (二零一八年三月二十四日)**  
**Final (24<sup>th</sup> March, 2018)**

<b>小五組</b>	<b>組別項目</b>	<b>試卷</b>
<b>Primary 5</b>	<b>Group Event</b>	<b>Question Paper</b>

**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.

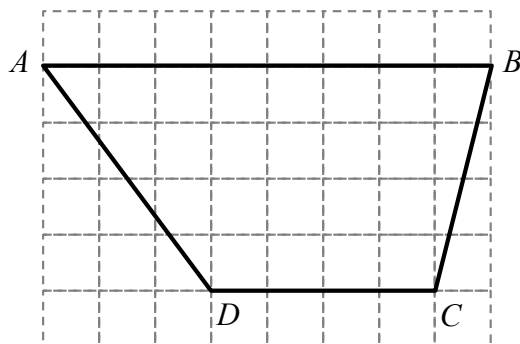
時限：四十五分鐘

Time allowed: 45 minutes

總分：400

Total marks: 400

1. 寫下最小的 4 個連續三位奇數，而這 4 個奇數皆為合成數。(12 分)  
Write down the 4 smallest consecutive 3-digit odd numbers, where all of them are composite numbers.(12 marks)
  
2. 已知  $a \div 17 = 8 \dots\dots b$ ，求  $a$  的最大可能值。(16 分)  
It is given that  $a \div 17 = 8 \dots\dots b$ , find the greatest possible value of  $a$ .(16 marks)
  
3. A、B、C 和 D 四人參加歌唱比賽，已知：  
  1. C 和 D 是朋友；
  2. B 和 D 是兄弟；
  3. A 比 B 名次較前；
  4. 獲得第二名的參賽者不認識其他參賽者；
  5. 獲得第一名和第三名的參賽者互不認識。
 判斷 A, B, C, D 的 名次。(16 分)  
 Four person, A, B, C and D participated in a singing competition. It is given that  
  1. C and D are friends;
  2. B and D are brothers;
  3. The ranking of A is higher than B;
  4. The competitor who won the second place does not know other competitors;
  5. The first and third place winners do not know each other.
 Determine the rankings of A, B, C and D respectively.(16 marks)
  
4. 如下圖所示， $ABCD$  是一個梯形。試在圖中加上兩條適當的直線，從而把  $ABCD$  切割成三個面積相等的圖形。(20 分)  
As shown in the figure below,  $ABCD$  is a trapezium. Add two suitable straight lines on the figure so as to cut it into three figures with same areas.(20 marks)

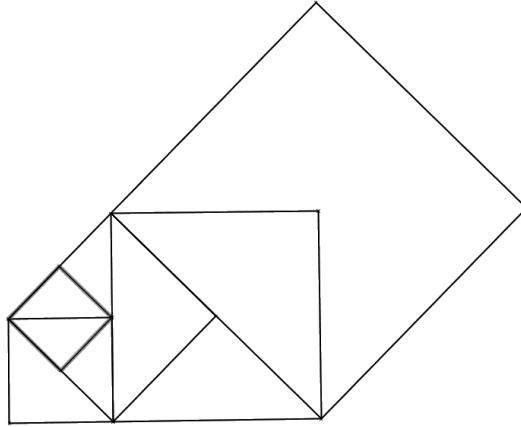


5. 圖中為一組互相重疊的正方形；如果最小的正方形的面積是 5 平方單位，求最大的正方形的面積。

(20 分)

The following figure shows a set of overlapping squares. If the area of the smallest square is 5 square units, find the area of the largest square.

(20 marks)

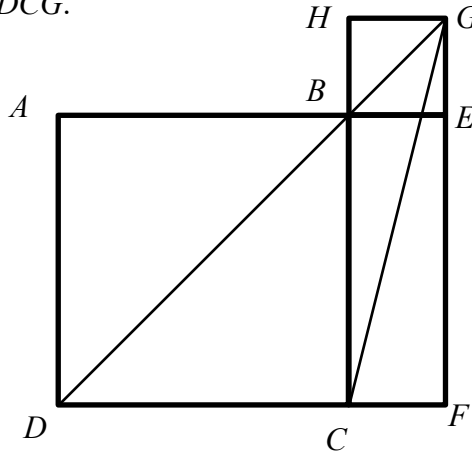


6. 圖中， $ABCD$  和  $HGEB$  是正方形， $AEFD$  是長方形。如果正方形  $ABCD$  和長方形  $AEFD$  的面積分別是  $3 \text{ cm}^2$  和  $4 \text{ cm}^2$ ，求三角形  $DCG$  的面積。

(21 分)

In the figure,  $ABCD$  and  $HGEB$  are squares and  $AEFD$  is a rectangle. If the area of square  $ABCD$  and rectangle  $AEFD$  are  $3 \text{ cm}^2$  and  $4 \text{ cm}^2$  respectively. Find the area of triangle  $DCG$ .

(21 marks)



7. 老師早會點名時，缺席人數是出席人數的  $\frac{1}{9}$ 。中午時有一人早退，缺席

人數是出席人數的  $\frac{3}{22}$ ，求班中總人數。

(22 分)

When the teacher took attendance in the morning assembly, the number of students who are absent is  $\frac{1}{9}$  of those who are present. At noon, one student

took early leave, the number of students who are absent becomes  $\frac{3}{22}$  of those

who are present. Find the total number of students in the class.

(22 marks)

8. 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？ (23 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.

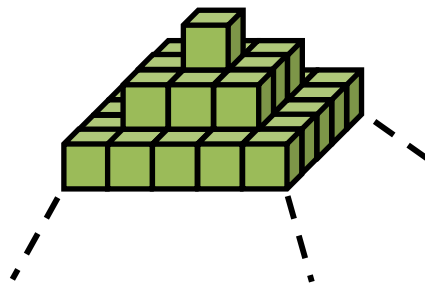
Once Mr. Chan reaches town  $B$ , he takes a 30 minutes break, then he runs back to town  $A$ . Miss Lee starts running from town  $A$  to town  $B$  at 8:15 a.m. at 4 km/hour.

When will they first meet each other? (23 marks)

9. 有一塊長方體金屬，當它放進一個容器裏，容器內會剩餘  $6565 \text{ cm}^3$  空間。當金屬塊加熱後，它的長度，闊度和高度分別增加 15%，10%和 5%。將金屬加熱後再放入同樣的容器裏面，容器中將沒有剩餘空間，求容器的容量。 (24 分)

A solid metal is in the form of a cuboid. When it is put into a container, there is  $6565 \text{ cm}^3$  space left inside the container. After the solid metal is heated, the length, width and height will expand 15%, 10% and 5% respectively. After heated and expanded, the solid metal is put into the same container again, there is no space left inside the container. Find the capacity of the container. (24 marks)

10.



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  $1 \times 1$  件正方體、第二層有  $3 \times 3$  件、第三層有  $5 \times 5$  件，如此類推。假設積木山共有 10660 件正方體，求積木山的高度。 (25 分)

A brick hill is made by a number of cubes with length 1 cm. The first layer (top layer) of the hill contains  $1 \times 1$  piece of cube, the second layer contains  $3 \times 3$  pieces of cubes, the third layer contains  $5 \times 5$  pieces of cubes and so on. If the hill contains 10660 cubes, find the height of the hill. (25 marks)

11. 假設  $n$  個大小不同之圓形相交最多有 1260 相交點，求  $n$  的值。 (27 分)

If the maximum number of the points of intersection from  $n$  different sizes of circles is 1260, find the value of  $n$ . (27 marks)

12. 一張長方形桌球枱闊 2 米、長  $s$  米 ( $s$  為整數)，四角均有一個小洞。一圓球由其中一角以(半個直角)  $45^\circ$  射出，如圓球撞向枱邊，則以(半個直角)  $45^\circ$  反彈；若圓球進入小洞則完結。假設圓球撞向枱邊共 103 次才進入小洞完結，求  $s$  的最小值與最大值之總和。 (30 分)

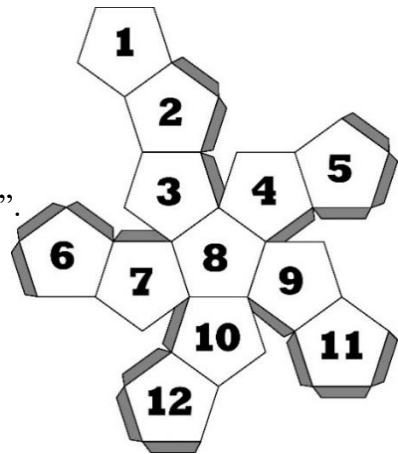
A rectangular billiard table of size  $2\text{ m} \times s\text{ m}$  ( $s$  is an integer) contains one hole at each corner. A billiard ball is released with an angle  $45^\circ$  (half right angle) from an arbitrary corner. If the ball collides with the edge, it will rebound with an angle  $45^\circ$  (half right angle) away from the edge. It will come to an end if the ball falls into the hole. Find the sum of the largest and the smallest values of  $s$  if the number of rebounds is 103 times. (30 marks)

13. 圖中是一個正十二面體的摺紙圖樣。

- (a) 「1」的對面是什麼數字？  
 (b) 求與「2」相鄰的數字之和。

The figure is a net of a regular dodecahedron.

- (a) Which number is opposite to "1"?  
 (b) Find the sum of all the numbers adjacent to "2".



(34 分)

(34 marks)

14. 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？ (36 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?

(36 marks)



15. 現有兩支水管  $A$  及水管  $B$ 。單用水管  $A$  注滿一個水池需用 6 小時，同時用水管  $A$  及水管  $B$  注滿同一個水池需用 5 小時。求單用水管  $B$  注滿該水池所需的時間。

There are two pipes, pipe  $A$  and pipe  $B$ . It needs 6 hours to use pipe  $A$  to fill up a pool alone and it needs 5 hours to use both pipe  $A$  and pipe  $B$  to fill up the same pool. Find the time needed to fill up the pool by pipe  $B$  only.

(36 分)

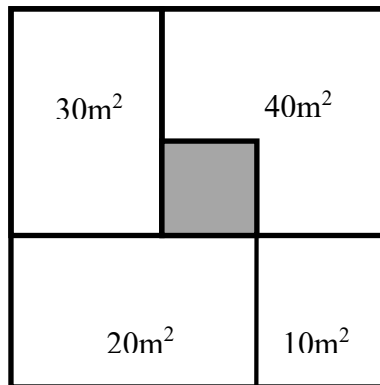
(36 marks)

16. 一個正方形被分成四個長方形，四個長方形的面積分別為  $30\text{m}^2$ ， $40\text{m}^2$ ， $10\text{m}^2$  及  $20\text{m}^2$ 。在其中一個長方形中有一陰影小正方形。求圖中陰影小正方形的面積。

A square is divided into four rectangles. The areas of the four rectangles are  $30\text{m}^2$ ,  $40\text{m}^2$ ,  $10\text{m}^2$  and  $20\text{m}^2$  respectively. There is one small shaded square in one of the rectangles. Find the area of the shaded small square.

(38 分)

(38 marks)



試卷完 END OF PAPER