

第二屆全港小學數學挑戰賽(2015-2016)
The Second Annual Hong Kong Primary Mathematics Challenge (2015-2016)

決賽 (二零一六年四月二日)
Final (2nd April, 2016)

小六組 組別項目 試卷
Primary 6 Group Event Question Paper

參賽者須知 Instructions to Contestants

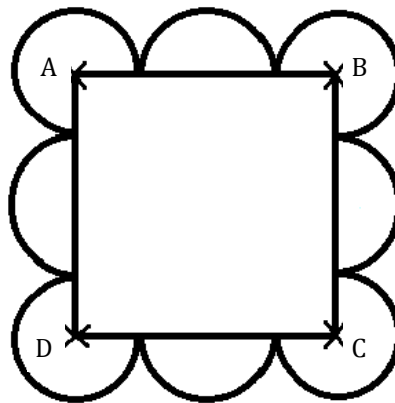
1. 在比賽過程中，參賽者必須將准考證放在桌上。
You should place your Admission Form on your desk for the whole session.
2. 於比賽期間必須關掉所有手提電話、通訊工具及其他響鬧裝置。
During the competition, you should switch off your mobile phone and any other electronic or communication devices that can emit sound.
3. 本項目以筆試形式舉行，須於限時 45 分鐘內完成所有題目。
Contestants 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. 255 至 330 之間有多少個質數? (12 分)
How many prime numbers are there in between 255 to 330? (12 marks)

2. 圖中的正方形邊長為 8 cm，四等弧的圓心分別為 A、B、C 及 D，而圖中各圓形的半徑皆相等，求弧的總長度。(π 以 3.14 計算) (12 分)
The length of a square is 8 cm, the centers of four equal arcs are A, B, C and D respectively. All of the circles have the same radius. Find the total length of the arcs.
(Let $\pi = 3.14$) (12 marks)



3. 房間內有 12 人。若每人與其餘的人都各握手，求握手的總次數。 (14 分)
There are 12 people in a room. If each of them shakes hands with the other, find the total number of times they shake hands. (14 marks)
4. 當 2500 被正整數 A 除時，其餘數是 8。問 A 的所有可能值共有多少個? (17 分)
When 2500 is divided by a positive integer A, the remainder is 8. How many possible values of A? (17 marks)
5. 某數學測驗的滿分為 100 分而合格分為 50 分。若全班 10 名同學皆以不同的分數考獲合格的成績，而前五名同學的平均得分是 77 分，排第一名同學的得分是 90 分，且每人得分是互不相同的整數，請問排第四名的同學最多得多少分? (19 分)
The full mark of a mathematics test is 100. The passing mark is 50. If all 10 candidates pass the test with different marks and the average mark of the candidates in the first five positions is 77 and the candidate in the 1st position scores 90 and all candidates get different integral scores, what is the maximum score of the candidate in the 4th position? (19 marks)

6. 一間餅店每天提供 8 款西餅，當中每款西餅的數量相同。某天開店時，有一名客人每款買 7 件，店員點算後發現餘下餅的數量相等於原來一款西餅數量的 4 倍，問原先共有多少件西餅？
(22 分)

A cake shop provided 8 types of cake every day. The quantity of each type was the same. One day, a customer bought 7 cakes for each type when the shop was just open. The staff found that the quantity of remaining cakes was equal to four times of one type in the beginning. How many cakes in total were there in the beginning?
(22 marks)

7. 如
If

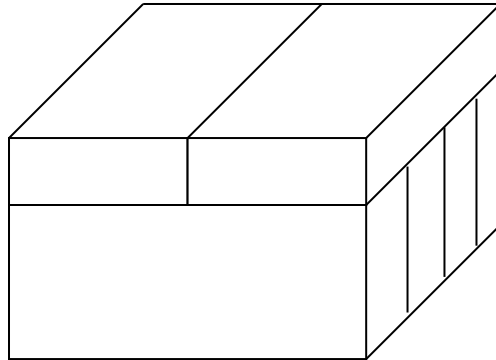
$$\begin{array}{cccc}
 1 = \bullet, & 2 = \bullet\circ, & 3 = \bullet\bullet, & 4 = \bullet\circ\circ, \\
 5 = \bullet\circ\bullet, & 6 = \bullet\bullet\circ, & 7 = \bullet\bullet\bullet, & 8 = \bullet\circ\circ\circ, \dots
 \end{array}$$

求 $\bullet\circ\bullet\bullet\circ$ 的值。
(23 分)

Find the value of $\bullet\circ\bullet\bullet\circ$.
(23 marks)

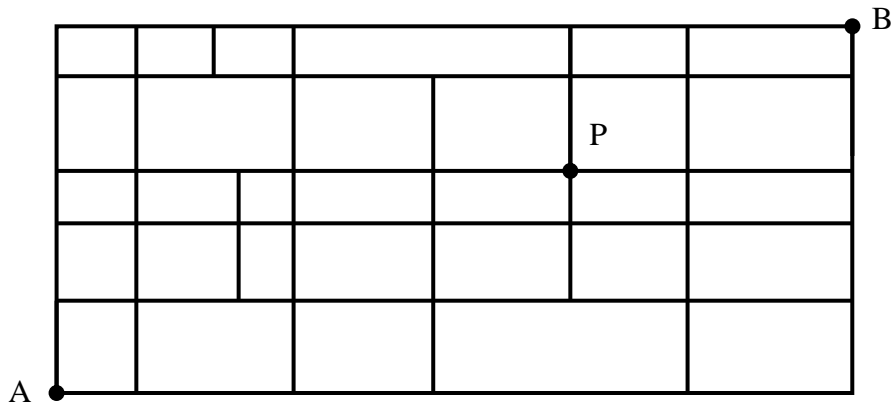
8. 下圖是由 6 個相同的長方體組合而成，已知它的體積是 1296 cm^3 ，求它的表面積是多少？
(25 分)

The following figure is formed by 6 identical cuboids. Given that the volume of the figure is 1296 cm^3 , find the surface area of the figure.
(25 marks)

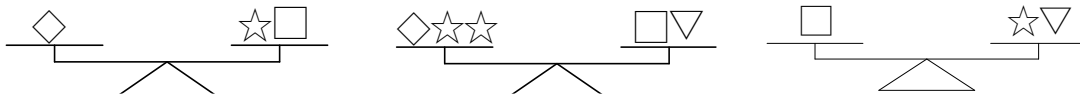


9. 如圖所示，從 A 點出發到 B 點，每步只能向上或向右走，求其中必須經過 P 點的共有多少種走法？ (26 分)

Refer to the following figure, if a person moves from point A to point B, he can move upwards or rightwards only. How many different ways are there that he must walk through point P? (26 marks)



- 10.



根據上圖中天秤所示，求 \diamond 、 \star 、 \square 和 ∇ 之重量的關係。

Find the relationships between the weights of \diamond , \star , \square and ∇ based on the balances shown above.

- (a) ∇ 的重量 = $\underline{\quad}$ \times \star 的重量
Weight of ∇ = $\underline{\quad}$ \times Weight of \star
- (b) \diamond 的重量 = $\underline{\quad}$ \times \star 的重量
Weight of \diamond = $\underline{\quad}$ \times Weight of \star
- (c) \square 的重量 = $\underline{\quad}$ \times \star 的重量
Weight of \square = $\underline{\quad}$ \times Weight of \star
- (d) \square 的重量 = $\underline{\quad}$ \times \diamond 的重量
Weight of \square = $\underline{\quad}$ \times Weight of \diamond
- (e) \diamond 的重量 = $\underline{\quad}$ \times ∇ 的重量
Weight of \diamond = $\underline{\quad}$ \times Weight of ∇

(25 分)

(25 marks)

11. 4_ _ 為一個三位數，已知在 2 至 10 的整數，該數只能被 7 整除，請列出各種可能性。
(29 分)

4_ _ is a three-digit number. It is known that from the integers 2 to 10, this number can be divisible by 7 only. List out all possible values of this three-digit number (29 marks)

12. 經過調查一班學生對科目的喜好後，所有人在中文、英文和數學三個科目中，至少喜歡一科。調查發現喜歡中文有 10 人，喜歡英文有 20 人，喜歡數學有 30 人，喜歡中文和英文有 3 人，喜歡中文和數學有 7 人，喜歡英文和數學有 9 人。此外，三個科目(中文、英文和數學)都喜歡的有 4 人，問這班學生共有多少人？
(31 分)

After a survey investigating students' favorite subjects, all students like at least one subject among the three subjects (i.e. Chinese, English and Mathematics).

We find that 10 students like Chinese, 20 like English and 30 like Mathematics.

Also, 3 students like both Chinese and English, 7 students like both Chinese and Mathematics, and 9 students like both English and Mathematics. Besides, 4 students like all three subjects (i.e. Chinese, English and Mathematics).

How many students are there in this class? (31 marks)

13. 求數字 2016 在以下的排列中出現的次數。
(32 分)

Find the number of times of the number 2016 appear in the following pattern.

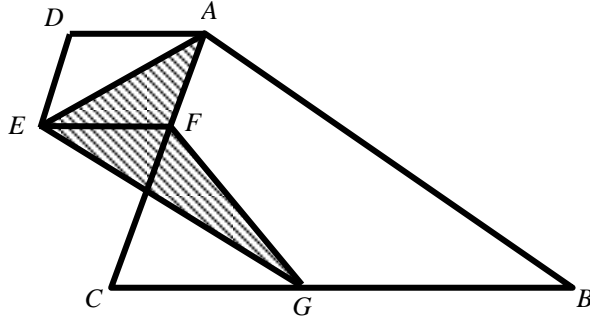
(32 marks)

1	2	3	4	...
2	4	6	8	...
3	6	9	12	...
4	8	12	16	...
5	10	15	20	...
.
.
.

14. 下圖由 三角形 ABC 及菱形 $ADEF$ 組成。已知三角形 ABC 的面積為 162 cm^2 ， AD 平行 BC 及 $2AC = 6AF = BC$ 。求陰影部份面積。
(34 分)

The figure below is made of a triangle ABC and a rhombus $ADEF$. It is given that the area of the triangle ABC is 162 cm^2 , AD is parallel to BC and $2AC = 6AF = BC$.

Find the area of the shaded region.
(34 marks)



15. 有四個不同的數。任意兩個數之積的結果如下：

There are four different numbers. The products of any two numbers are as follows:

4, 9, 16, 18, 32, 72

求這四個數。

(38 分)

Find these four numbers.

(38 marks)

16. 某三位數的所有質因數之和是 27，已知所有質因數皆沒有重複，求該數的最大值。
(41 分)

It is given that the sum of all prime factors of a 3-digit number is equal to 27. It is also known that all the prime factors are different. Find the largest value of the 3-digit number.

(41 marks)

試卷完 END OF PAPER