

第九屆全港小學數學挑戰賽(2022-2023)
The 9th Hong Kong Primary Mathematics Challenge (2022-2023)

決賽 (二零二二年十二月三日)
Final (3rd December, 2022)

小六組 個人項目 試卷
Primary 6 Individual Event Question Paper

參賽者須知 Instructions to Contestants

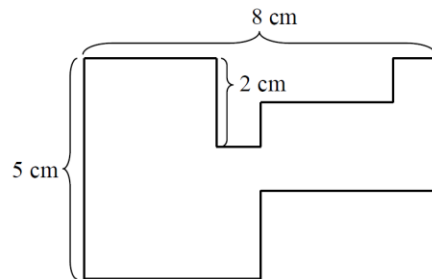
1. 在比賽過程中，參賽者必須將准考證放在桌上。
You should place your Admission Form on your desk for the whole session.
2. 於比賽期間必須關掉所有手提電話、通訊工具及其他響鬧裝置。
During the competition, you should switch off your mobile phone and any other electronic or communication devices that can emit sound.
3. 本項目以筆試形式舉行，須於限時一小時內完成所有題目。
Contestants should finish all questions in this 1-hour 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：一小時
Time Allowed: 1 hour

總分：100
Total marks: 100

1. 已知下圖中的所有角均為直角，求圖形的周界。 (3 分)

What is the perimeter of the following figure (cm), given that all the angles are right angles? (3 marks)



2. 一個泳池有冷水和熱水兩條水管注水。當兩條水管同時打開時，需要 15 小時注滿泳池。若只打開熱水管，則需要 30 小時注滿泳池。現只打開冷水管，需時多久才能注滿泳池？ (4 分)

A swimming pool has a hot water hose and a cold-water hose. When two hoses open, a swimming pool fill up water fully in 15 hours. If only the hot water hose open and fill up that swimming pool, it needs 30 hours. Now we use only the cold water hose to fill up the same swimming pool, how long should it be to fill up the swimming pool? (4 marks)

3. 1 至 2022 中同時被 3、5 及 8 整除的數字有多少個？ (4 分)

From 1 to 2022, how many numbers are divisible by 3, 5 and 8 at the same time? (4 marks)

4. 今年約翰和爸爸，媽媽的年齡分別是 9 歲、36 歲、34 歲，幾多年後，爸爸和媽媽的年齡總和是約翰的 4 倍？ (4 分)

The ages of John, his father and his mother are 9, 36 and 34 respectively this year. After how many years will the sum of the ages of John's father and mother be 4 times that of John? (4 marks)

5. $1 - 2 + 3 - 4 + 5 - 6 + 7 - \dots - 2022 + 2023 = ?$ (4 分)

$1 - 2 + 3 - 4 + 5 - 6 + 7 - \dots - 2022 + 2023 = ?$ (4 marks)

6. 在某一個月中，星期一多於星期二，星期天多於星期六，那麼這個月的 5 號是星期幾？ (4 分)

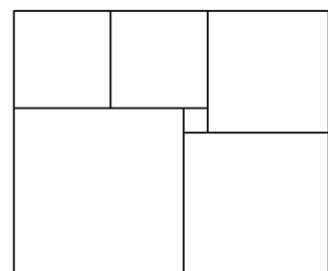
In a certain month, there are more Mondays than Tuesdays and Sundays more than Saturdays, so what day of the week is the 5th of the month? (4 marks)

7. 若 a 、 b 及 c 均為整數，且 $a + b = 2022$ 及 $c - a = 2023$ 。若 $a < b$ ，求 $a + b + c$ 的最大值。 (4 分)

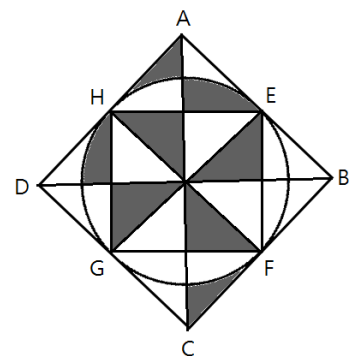
If a , b and c are integers, where $a + b = 2022$ and $c - a = 2023$. If $a < b$, find the greatest value of $a + b + c$. (4 marks)

8. 右圖顯示為由六個正方形合併而成的長方形，當中最小的正方形的邊長為 1 cm，求該長方形的面積。 (5 分)

A rectangle is divided into six small squares, as shown in the following figure. Given that the length of the smallest square is 1 cm. What is the area of the rectangle (cm²)? (5 marks)



9. 桌子上有 1 個蘋果、4 個橙和 1 個梨。這 6 個水果的平均重量是 250 克。如果橙的平均重量是 240g，梨的重量是蘋果重量的 2 倍，蘋果的重量是多少？ (5 分)
 There are 1 apple, 4 oranges and 1 pear on the table. The average weight of these 6 fruits is 250g. If the average weight of orange is 240g, and the weight of pear is two times that of apple. What is the weight of apple? (5 marks)
10. 若 $\frac{398}{275} = 1 + \frac{1}{2 + \frac{1}{4 + \frac{x}{29}}}$ ，求 x 。 (5 分)
 If $\frac{398}{275} = 1 + \frac{1}{2 + \frac{1}{4 + \frac{x}{29}}}$, find x . (5 marks)
11. 求 6^{2022} 被 7 除的餘數。 (5 分)
 Find the remainder when 6^{2022} is divided by 7. (5 marks)
12. 求 2023×2022 除以 13 的餘數。 (5 分)
 Find the remainder when 2023×2022 is divided by 13. (5 marks)
13. 若 $105 \times 588 \times 1782 \times 3185 \times \star$ 的末尾能出現六個 0，求 \star 的最小值。 (5 分)
 If the last 6 digits of the result of $105 \times 588 \times 1782 \times 3185 \times \star$ are 0, find the least value of \star ? (5 marks)
14. 從一張長方形的硬卡紙(邊長為正整數)的四個角均剪出一個邊長為 5 cm 的正方形，並把該硬卡紙摺成一個長方紙盒使得該容量為 5405 cm^3 。求原來長方形的硬卡紙的面積。 (5 分)
 Cut a 5 cm square from all four corners of a piece of rectangular cardboard (sides with positive integer), and fold the cardboard into a rectangular box such that its capacity is 5405 cm^3 . Find the area of the original rectangle of cardboard. (5 marks)
15. 計算 4171 和 5891 的最大公因數。 (5 分)
 Calculate the greatest common factor of 4171 and 5891. (5 marks)
16. 圖中的圓是正方形 ABCD 的內接圓及正方形 EFGH 的外接圓。已知圓的半徑為 20 cm，求陰影部分的面積。(5 分)
 In the figure, the circle is incircle of square ABCD and circumcircle of square EFGH. It is given that the radius of the circle is 20 cm, find the area of the shaded region. (5 marks)



17. 如圖所示， $ABCDEF$ 為一六邊形，其中 $AB = BC = 13$ cm、 $CD = 8$ cm、 $DE = AF = 16$ cm 及 $EF = 10$ cm。已知各個扇形的半徑相等且以六邊形的頂點作為圓心，其中以 C 及 D 為圓心的扇形相切。求陰影部分的周界。

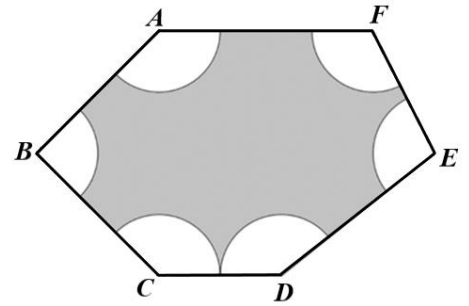
(取 $\pi = 3.14$)

(6 分)

In the figure, $ABCDEF$ is a hexagon with $AB = BC = 13$ cm, $CD = 8$ cm, $DE = AF = 16$ cm and $EF = 10$ cm. It is given that the radii of each sector are equal and the vertex of the hexagon is the center of the circle, where the sectors with the centers C and D are tangent. Find the perimeter of the shaded area.

(take $\pi = 3.14$)

(6 marks)

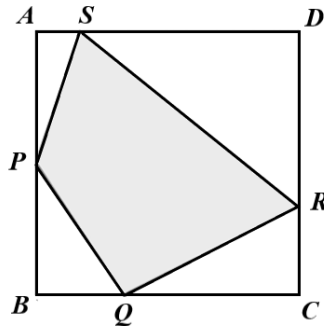


18. 如圖所示， $AS = 2$ cm、 $AP = 6$ cm、 $BQ = 4$ cm、 $DR = 8$ cm。若正方形 $ABCD$ 內的四邊形 $PQRS$ 的面積為 70 cm²，求正方形 $ABCD$ 的邊長。

(7 分)

In the figure, $AS = 2$ cm, $AP = 6$ cm, $BQ = 4$ cm, $DR = 8$ cm. If the area of the quadrilateral $PQRS$ inside the square $ABCD$ is 70 cm², find the side length of the square $ABCD$.

(7 marks)

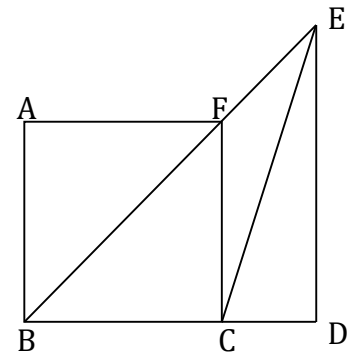


19. 如圖所示， $ABCF$ 一個正方形， $\triangle BEC$ 的面積比正方形 $ABCF$ 面積小 18 cm²。已知 $BC = 3CD$ ，求正方形 $ABCF$ 的面積。

(7 分)

In the figure, $ABCF$ is a square. The area of $\triangle BEC$ is 18 cm² smaller than the area of the square $ABCF$. If $BC = 3CD$, find the area of square $ABCF$.

(7 marks)



20. $\frac{1}{\frac{1}{2+4} + \frac{1}{2+4+6} + \frac{1}{2+4+6+8} + \frac{1}{2+4+\dots+10} + \dots + \frac{1}{2+4+\dots+2022}}$ 的整數部分是多少？

(8 分)

What is the integer part of

$$\frac{1}{\frac{1}{2+4} + \frac{1}{2+4+6} + \frac{1}{2+4+6+8} + \frac{1}{2+4+\dots+10} + \dots + \frac{1}{2+4+\dots+2022}}$$

(8 marks)

試卷完 END OF PAPER