

Hong Kong Mathematics Olympiad (1998 – 99)

Heat Event (Individual)

香港數學競賽 (1998 – 99)

初賽項目(個人)

除非特別聲明，答案須用數字表達，並化至最簡。

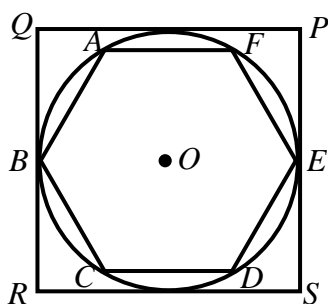
Unless otherwise stated, all answers should be expressed in numerals in their simplest form.

1. 有一圓，其圓周是 14π cm。若一弧所對的圓心角是 $\frac{1}{7}$ 個弧度，設這弧的長度是 X cm，求 X 的數值。

The circumference of a circle is 14π cm. Let X cm be the length of an arc of the circle, which subtends an angle of $\frac{1}{7}$ radian at the centre. Find the value of X .

2. 在圖一， $ABCDEF$ 是一正六邊形及其面積是 $3\sqrt{3}$ cm²。設正方形 $PQRS$ 的面積是 X cm²，求 X 的數值。

In the figure, $ABCDEF$ is a hexagon with area equal to $3\sqrt{3}$ cm². Let X cm² be the area of the square $PQRS$, find the value of X .



圖一

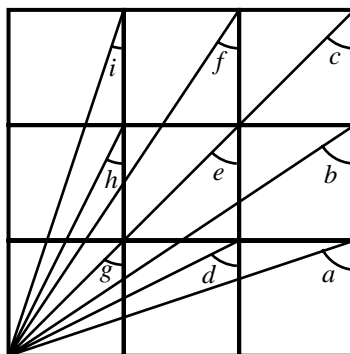
Figure 1

3. 已知 8 點，其中沒有任何 3 點是共線的。求以任意 3 點作為三角形頂點的三角形的個數。

8 points are given and no three of them are collinear. Find the number of triangles formed by using any 3 of the given points as vertices.

4. 在圖二，有一個 3×3 正方形。設 $\angle a + \angle b + \dots + \angle i = X^\circ$ ，求 X 的數值。

In the figure, there is a 3×3 square. Let $\angle a + \angle b + \dots + \angle i = X^\circ$, find the value of X .



圖二

Figure 2

5. 在 0 至 10^6 之間，有多少個整數 n ，使得 n^3 的個位數字是 1？

How many integers n are there between 0 and 10^6 , such that the unit digit of n^3 is 1?

6. 已知 a 、 b 、 c 是正整數，且滿足 $a < b < c = 100$ ，求以 a cm、 b cm、 c cm 為邊長的三角形的個數。

Given that a , b , c are positive integers and $a < b < c = 100$, find the number of triangles formed with sides equal a cm, b cm and c cm.

7. 一班青年參加旅行，他們同意所有消費平均攤分。整個活動，他們共用去 288 元。其中有一位成員無法支付其所應付出的部份。其他成員願意各多付 4 元，湊夠其數。問共有多少青年參加這次旅行。

A group of youngsters went for a picnic. They agreed to share all expenses. The total amount used was \$ 288. One youngster had no money to pay his share, and each of the others had to pay \$ 4 more to cover the expenses. How many youngsters were there in the group?

8. 某兩位數其值等於它的位值的和的 4 倍。若將該數的個位和十位數字相調，這個新兩位數的值比其位值的和的 5 倍多出 18。求該數。

A two-digit number is equal to 4 times the sum of the digits, and the number formed by reversing the digits exceeds 5 times the sum of the digits by 18. What is the number?

9. 已知下列序列的第 1001 項的分母為 46，求該項的分子。

$$\frac{1}{2}, \frac{1}{3}, \frac{2}{3}, \frac{1}{4}, \frac{2}{4}, \frac{3}{4}, \frac{1}{5}, \frac{2}{5}, \frac{3}{5}, \frac{4}{5}, \dots$$

Given that the denominator of the 1001th term of the following sequence is 46, find the numerator of this term.

$$\frac{1}{2}, \frac{1}{3}, \frac{2}{3}, \frac{1}{4}, \frac{2}{4}, \frac{3}{4}, \frac{1}{5}, \frac{2}{5}, \frac{3}{5}, \frac{4}{5}, \dots$$

10. 下列加法算式中，若字母‘S’代表 4，那麼字母‘A’代表甚麼數字？

In the following addition, if the letter ‘S’ represents 4, what digit does the letter ‘A’ represent?

$$\begin{array}{r} \text{SEE} \\ \text{SEE} \\ \text{SEE} \\ + \text{YES} \\ \hline \text{EASY} \end{array}$$