

**Po Leung Kuk**

**2<sup>nd</sup> Primary Mathematics World Contest**

**Team Contest**

T1. What is the 1998<sup>th</sup> number in the following sequence ?  
1, -2, 2, -3, 3, -3, 4, -4, 4, -4, 5, -5, 5, -5, 5, -6, 6, -6, 6, -6, 6,.....

**Answer :** -63.

T2 Tom started work on a job alone for 30 days. Jerry continued the job alone for 5 days, and finally they worked together for another 10 days to complete that job. For the same job, if Tom and Jerry work together, they can complete it in 20 days. Assuming Tom and Jerry each work at a constant rate throughout, how many days will Tom take to complete that job alone?

**Answer :** 100.

T3. The set  $L$  consists of all positive integers which leave a remainder of 1 when divided by 3. A member of  $L$  (other than 1) is called an  $L$ -prime if it is not the product of two members of  $L$ , other than itself and 1. Which is the 8th  $L$ -prime?

**Answer:** 31 .

T4. There are many circles on a plane. Each is divided into four parts by two mutually perpendicular diameters. Each part is painted either red, yellow or blue. No matter how the circles are rotated in the plane, they are different from one another. At most how many circles are painted with all three colors?

**Solution :** 9.

- T5. Find the largest positive integer with the following properties :
- (a) all the digits are different.
  - (b) each two consecutive digits form a number divisible by either 17 or 23.

**Answer : 923468517.**

- T6. There were 3 students in an athletics competition of at least two events. Each student participated in all events. In each event, student who finished second got more points than the student who finished third but less than the student who finished first. All scores were positive integers and all the events used the same 3 scores. At the end of the competition, the total scores of the 3 students were 5, 9 and 16. Determine the first-place score for each event.

**Answer : 7.**

- T7. A leaf is torn from a book of not more than 500 pages. The sum of the remaining pages numbers is 19905. What is the sum of the two page numbers of the leaf torn out ?

**Answer : 195.**

- T8. A rectangular lawn is surrounded by a path 1 meter in width and forming a larger rectangle. The dimensions of the lawn are in whole number of metres and the area of the path equals the area of the lawn. Find the smallest possible area of the path in metres .

**Answer :28.**

T9. A, B, C, D and E play a game in which each is either a lion or a goat. A lion's statement is always false and a goat's statement is always true.

A says B is not a goat.

C says D is a lion.

E says A is not a lion.

B says C is not a goat.

D says that E and A are different kinds of animals.

Who are the lions?

**Answer : B, D.**

T10. In the following expression, each letter represents a digit. Same digits are represented by the same letter, and different letters stand for different digits. Any digit can replace any square, find the 5-digit number ABCBA?

$$\begin{array}{r}
 \square \square 1 \\
 \times \quad 9 \square \\
 \hline
 \square 9 \square \square \\
 \square 8 \square \square \\
 \hline
 A \quad B \quad C \quad B \quad A
 \end{array}$$

Answer:

$$\begin{array}{r}
 \quad \quad \quad 8 \quad 7 \quad 1 \\
 \quad \quad X \quad \quad 9 \quad 8 \\
 \hline
 \quad \quad \quad 6 \quad 9 \quad 6 \quad 8 \\
 \quad \quad 7 \quad 8 \quad 3 \quad 9 \\
 \hline
 \quad \quad 8 \quad 5 \quad 3 \quad 5 \quad 8
 \end{array}$$

