亞洲國際數學奧林匹克聯合會

ASIA INTERNATIONAL MATHEMATICAL OLYMPIAD UNION

亞洲國際數學奧林匹克公開賽初賽

Asia International Mathematical Olympiad Open Trials

小三組 Grade 3

時限：70 分鐘

Time allowed: 70 minutes

試題

Question Paper

本試題不可取走。

THIS QUESTION PAPER CANNOT BE TAKEN AWAY.

未得監考官同意，切勿翻閱試題，否則參賽者將有可能被取消資格。

DO NOT turn over this Question Paper without approval of the examiner.
Otherwise, contestant may be DISQUALIFIED.

All answers should be written on the ANSWER SHEET.

Section A – each question carries 4 marks

1) Find the value of 123 + 456 + 789 – 159 – 426 – 783.

2) If the 1st of February of a year is a Monday. Which day of the week is the 1st of January of the same year?

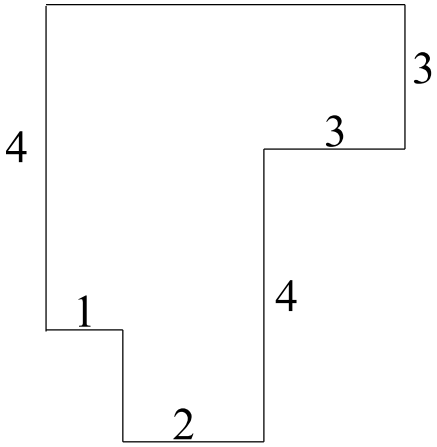
3) It is known that $11\times11=121$ and $111\times111=12321$. Find the value of 11111×11111.

4) If a number is multiplied by 9 and add the product by 1009, the result is 11008. Find the number.

5) One wrongly wrote the tens digit of a number as 1 instead of 3 and the thousands digit of another number as 8 instead of 5. If sum of those wrongly written numbers is 9999, what is the correct sum?

6) There are two numbers. Their sum is 2017, their difference is 2015. What is the larger number?

7) Find the perimeter of the figure if all angles in the figure are right angles.



8) If $a\oplus b=a+b\times3+a\div2$, find the value of $(16\oplus16)\oplus16$.

~ End of section A ~

請以最簡形式填寫答案。若計算結果是分數，請化至最簡，並確保為真分數或帶分數，或將計算結果寫成小數。
答案可以根式表示，唯該根式必須是最簡形式。除特別註明外，毋需填寫單位。錯誤單位將不給予任何分數。
Write down the answer in the simplest form. If the calculation result is a fraction, please write down the answer as a proper or mixed fraction, decimal figure is also accepted. You may use square root to represent the answer which is in the simplest form.
Unless otherwise stated, no need to write down any unit. Marks will NOT be given for incorrect unit.

All answers should be written on the ANSWER SHEET.

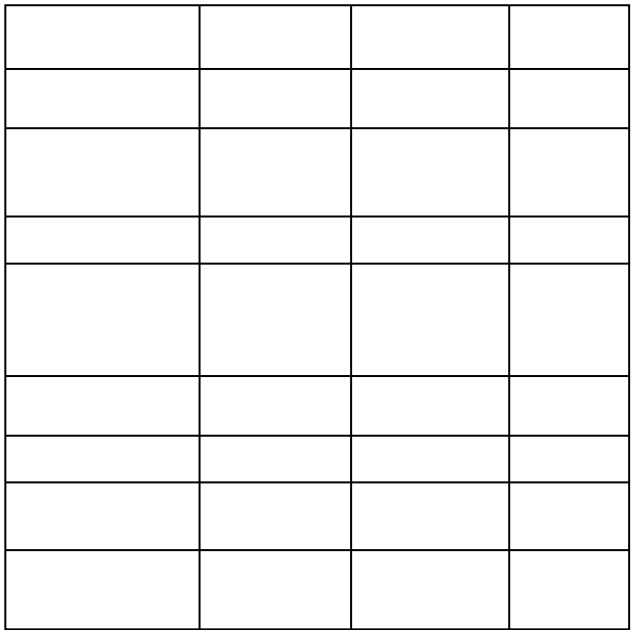
Section B – each question carries 5 marks

9) Find the value of $2016\times337-1016\times337$.

10) The dining time of Mason each day is 8 times than that of Leo. If Mason's dining time is 14 hours longer than that of Leo. How many hours does Mason used for eating every day?

11) Given a multiplication $A \times B = C$. If we increase A by 6 while B is unchanged, C is increased by 24. If we decrease B by 2 while A is unchanged, C is decreased by 50. Find the value of $A - B$.

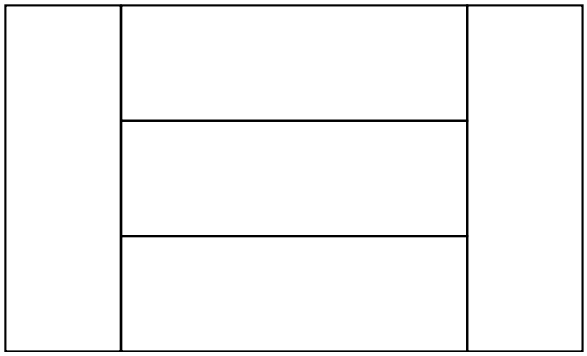
12) How many are rectangles are there in the figure below?



13) The perimeter of a rectangle is 100cm. If the length of it is 10cm longer than its width. What is the area of the rectangle (in cm^2)?

All answers should be written on the ANSWER SHEET.

14) The larger rectangle in the figure is formed by 5 identical smaller rectangles. If the perimeter of the larger rectangle is 52cm. Find the perimeter of a small rectangle.



15) Peggy is punished to copy 'Chicken leg' repeatedly. How many times did the letter "e" appear more than the letter "g" when Peppy had written 1009 letters?

16) If a certain number of '2's and '5's are multiplied together (at least one each). Can we know the unit digit of the product?
(Write down CANNOT on your answer sheet if the unit digit cannot be found; otherwise write the unit digit as your answer.)

~ End of section B ~

請以最簡形式填寫答案。若計算結果是分數，請化至最簡，並確保為真分數或帶分數，或將計算結果寫成小數。
答案可以根式表示，唯該根式必須是最簡形式。除特別註明外，毋需填寫單位。錯誤單位將不給予任何分數。
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All answers should be written on the ANSWER SHEET.

Section C – each question carries 7 marks

17) At the beginning, David has \$26 more than that of Poppy, then they went shopping :
i) David bought 3 bottles of coke, Poppy bought 5 bottles
ii) David bought 4 ice-cream bars, Poppy bought 6
In the end David has \$42 more than that of Poppy. If an ice-cream bar is \$2 more expensive than that of coke, what is the price of a bottle of coke?

18) Charles have some money. In each morning, Charles will do the following：
Separate the money into three piles of equal value, put one pile into the piggy bank, then put \$2 into the piggy bank. It is also known that in the afternoon he spent \$7, \$4 and \$8 in the first, second and the third day. At the night in the third day, he has \$6 left. How much is saved in the piggy bank by then?

19) In a sequence, if the difference of any two consecutive terms is the same, we call the sequence an **arithmetic sequence**. For example, 2, 4 , 6 , 8 , …, 100 is an arithmetic sequence with 50 terms. Also the first term of the sequence is 2, and the 50^{th} term is 100 and the common difference is 2.
If the first term of an arithmetic sequence is a, the last term is b and the number of terms is c. We define the sum of the sequence to be $(a、b、c)$.
(e.g. $(2、100、50) = 2 + 4+ 6 + 8 + 10 + \ldots + 100$).
Find the value of $(1、51、26)$.

20) In a sequence, if the difference of any two consecutive terms is the same, we call the sequence an **arithmetic sequence**. For example, 2, 4 , 6 , 8 , …, 100 is an arithmetic sequence with 50 terms. Also the first term of the sequence is 2, and the 50^{th} term is 100 and the common difference is 2.
If the first term of an arithmetic sequence is a, the last term is b and the number of terms is c. We define the sum of the sequence to be $(a、b、c)$.
(e.g. $(2、100、50) = 2 + 4+ 6 + 8 + 10 + \ldots + 100$).

Find the value of $(12、600、50) \div (2、100、50)$.

~ End of Paper ~