



**PERMATO**  
Persatuan Matematik Olympiad Malaysia



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SEKOLAH BERPRESTASI TINGGI



**黎明华文小学**  
SJK (C) LAI MENG



E Mathematics Olympiad System

# Malaysia International Mathematics Olympiad Competition 2018



24 November, 2018

9.30 am – 11.00 am

**- Middle Primary Paper -**

Jointly Organised by :

**Persatuan Matematik Olimpiad Malaysia (PERMATO)**  
**Sekolah Jenis Kebangsaan (Cina) Lick Hung Subang Jaya**  
**Sekolah Jenis Kebangsaan (Cina) Lai Meng Bukit Jalil, Kuala Lumpur**  
**E Mathematics Olympiad System**

马来西亚数学奥林匹克学会  
力行国民型华文学校  
黎明华文小学  
数学奥林匹克学研中心  
联合主办

## Instructions:

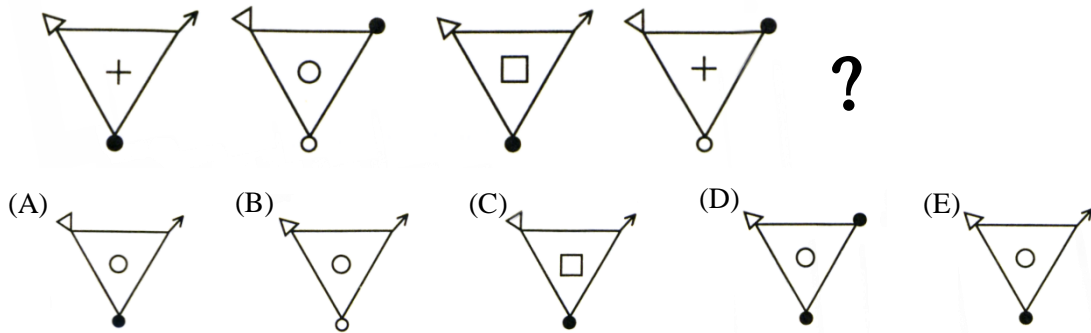
- Do not turn to the first page until you are told to do so.
- Write down your name, your contestant number and your school's name on the answer sheet.
- Write down all answers on the answer sheet. Only Arabic NUMERICAL answers are needed.
- Answer all 25 problems. The total is 120 points. For problems involving more than one answer, full credit will be given only if ALL answers are correct, no partial credit will be given. There is no penalty for a wrong answer.
- Diagrams shown may not be drawn to scale.
- No calculator or calculating device is allowed.
- Answer the problems with pencil, blue or black ball pen.
- All papers shall be collected at the end of this test.

## Section A ( 4 marks each )

## A 组 (每题 4 分)

1. Compute :  $(2018 \times 125) - (1218 \times 125)$   
 计算:  $(2018 \times 125) - (1218 \times 125) = ?$

2. Which of the figures will come next in the series? 选出下一个相关的图形。

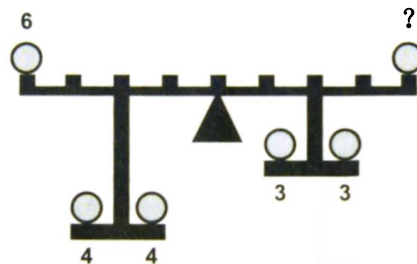


3. Find out the two signs to be interchanged for making following equation correct.  
 请找出两个被对调了的运算符号, 使等式成立。

$$51 \div 3 + 17 \times 2 - 12 = 10$$

- (A) + and  $\div$       (B) - and  $\times$       (C)  $\div$  and  $\times$       (D)  $\times$  and +

4. What weight should be placed at the question mark in order to balance the scales?  
 为了使天平保持平衡, 问号处应该填多少?

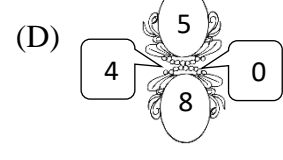
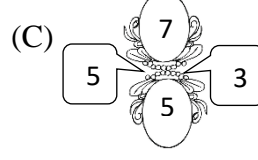
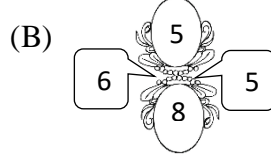
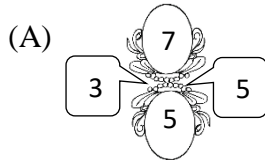
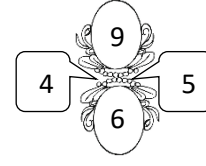
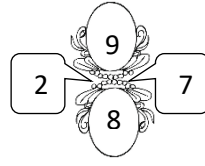
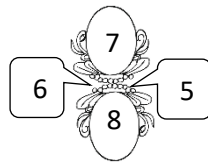
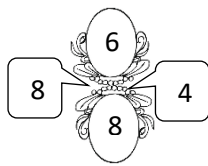


5. 17 gongs numbered from 1 to 17 are put into a circle. Alan strikes each of them in turn clockwise. When he struck the 2018<sup>th</sup> time, he hit exactly gong 12. Which gong did he strike first?

编号为 1 至 17 的 17 个铜锣摆成一个圆圈, 艾伦按照顺时针方向以每次敲击一个铜锣, 当他敲击到 2018 次的时候, 正好是编号为 12 的铜锣, 那么艾伦第一次敲击的铜锣编号是多少?

6. Can you work out which diagram from A to D is following the same rule as the diagram below.

下面图形中的数字是有规律的排列着，从 A~D 的 4 个图形中，选出一个关系相同的图形。



7. The average of 14 distinct positive integers is 10. What is the greatest possible value of these numbers?

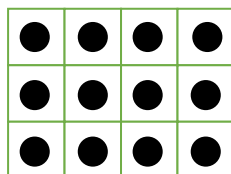
14 个不同的正整数的平均数为 10，其中的最大的数可以是多少？

8. A rectangle and a square have the same perimeter. The side of the square is 28 cm. The length of the rectangle is 6 times its breadth. What is the area of the rectangle?

一个长方形与一个正方形的周长相同。正方形的边长为 28 cm，长方形的长是宽的 6 倍，求长方形的面积是多少？

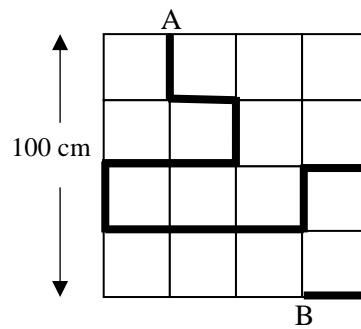
9. There is a chess piece positioned in each square of the chessboard as shown below. What is the least number of chess pieces that we need to remove so that any four of the chess pieces left do not form the four vertices of a square?

如图所示，在方格网的每个小方格中心，都放有一枚围棋子，至少要去掉多少枚围棋子，才能使剩下的棋子中，任意四枚都不构成正方形的四个顶点。



10. The figure shown below is formed by 16 identical small squares. Find the length of the thick line that goes from A to B.

如图所示，大正方形是由16个相同的小正方形所组成，求从A到B较粗的黑线总长度。



Section B ( 5 marks each )

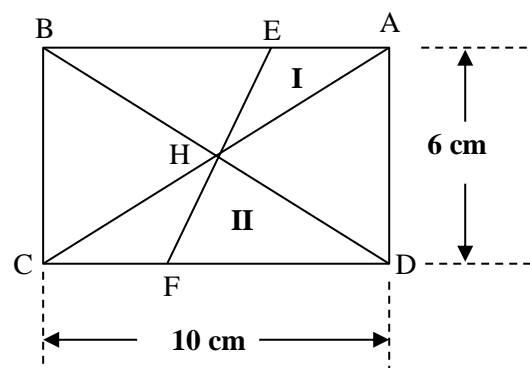
B 组 (每题 5 分)

11. Peter wants to make a 100 ml of 5% alcohol solution by mixing a quantity of a 2% alcohol solution with a 7% alcohol solution. What are the quantities of each of the two solutions (2% and 7%) he has to use?

彼得要把浓度为 2% 的酒精溶液和 7% 的酒精溶液，配成 100 ml 浓度 5% 的酒精溶液，那么，他需要 2% 的酒精溶液和 7% 的酒精溶液各多少 ml?

12. Find the total area of region I and II of rectangle ABCD if the length is 10 cm and the width is 6 cm.

长方形 ABCD，其长为 10 cm，宽为 6 cm，求 I 和 II 的面积之和。



13. Assuming four of these dates are correct, which one is wrong?

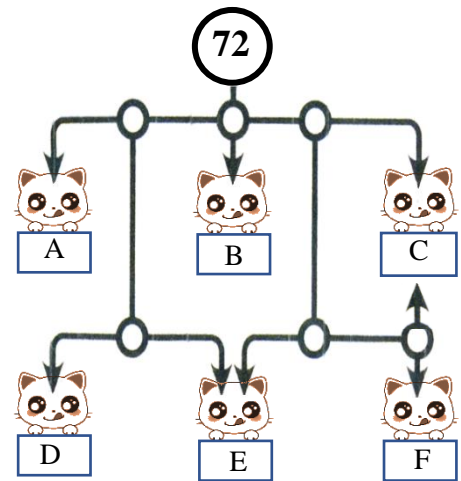
- (A) Saturday 7 January 1568
- (B) Saturday 21 January 1568
- (C) Saturday 11 February 1568
- (D) Saturday 11 March 1568
- (E) Saturday 14 April 1568

若以下的叙述中有四个是正确的，那么哪一个叙述是错的？

- (A) 1568 年 1 月 7 日星期六
- (B) 1568 年 1 月 21 日星期六
- (C) 1568 年 2 月 11 日星期六
- (D) 1568 年 3 月 11 日星期六
- (E) 1568 年 4 月 14 日星期六

14. Which kitty bank (A-F) will receive the largest amount of the \$72.00, knowing that the money is divided proportionally when split up?

将\$72.00 依照下图所示，按照每次裂分时的比例，分别存入小猫扑满里，哪一个扑满将分得最多钱？



15. Find the number of positive integer  $n$  such that the remainder is 7 when 2018 is divided by  $n$ .

有多少个正整数  $n$  使得 2018 除以  $n$  余 7？

16. A boy stands on a set of faulty scales that recorded his weight as 52 kg. His sister's weight is recorded as 56 kg and their combined weight is recorded as 111 kg. What is the actual weight of the girl?

有一个坏了（不准确）的磅秤，小男孩站上磅秤，显示他的重量为 52 kg。他的妹妹站上去，显示 56 kg，且两人一起站上磅秤，共重 111 kg。那么，这个小女孩的实际重量应该是多少？

17. There are twelve students seated around a circular table. Each of them has a slip of paper that they may choose to pass to either their clockwise or anticlockwise neighbour. After each person has transferred their slip of paper once, the teacher observes that no two students exchanged papers. In how many ways could the students have transferred their slips of paper?

有 12 位学生围着圆桌而坐。每位学生有一张纸，他们可以选择往顺时针方向或逆时针方向，将纸交给旁边的一位学生。所有学生完成一次动作后，老师发现没有任何两位学生互换了纸张，请问，他们的传递方法有几种可能？

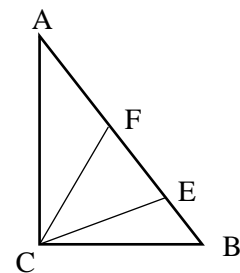
18. Let's define  $(3)=2 \times 3 \times 4$ ,  $(4)=3 \times 4 \times 5$ ,  $(5)=4 \times 5 \times 6$ ,  $(6)=5 \times 6 \times 7$ , ...,

If  $\frac{1}{(2018)} + \frac{1}{(2019)} = \frac{1}{(2019)} \times A$ , what is the value of A?

规定  $(3)=2 \times 3 \times 4$ ,  $(4)=3 \times 4 \times 5$ ,  $(5)=4 \times 5 \times 6$ ,  $(6)=5 \times 6 \times 7$ , ..., 如果  $\frac{1}{(2018)} + \frac{1}{(2019)} = \frac{1}{(2019)} \times A$ , 那么 A 的值是多少?

19. In a right angled triangle  $\triangle ABC$ ,  $\angle ACB = 90^\circ$ . E, F are on AB such that  $AE = AC$ ,  $BF = BC$ . Find  $\angle ECF$  in degrees.

在三角形  $\triangle ABC$  中,  $\angle ACB = 90^\circ$ . E, F 在 AB 线上,  $AE = AC$ ,  $BF = BC$ . 求  $\angle ECF$  的角度。



20. In a magic box, there are 4 buttons, if you put certain number of marbles inside the box and press first button then you will get double of the marbles. Pressing second button you would be given half of the marbles you put. Pressing third button you would be given half of the half number of marbles you have put and finally pressing fourth button you would be given only one marble.

If you wish to make a total of hundred marbles by pressing each of the button only once, how many marbles you must put at first in the box?

在一个魔术盒中, 有4个按钮, 如果你在盒子里放一定数量的弹珠并按下第一个按钮, 那么你将得到原有数量两倍的弹珠; 按第二个按钮, 你将获得原来数量的一半; 按下第三个按钮, 你将获得原有弹珠数量一半的一半, 最后按下第四个按钮, 你将只获得一个弹珠。

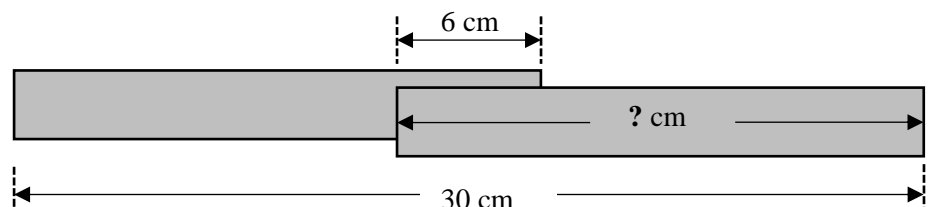
如果你想通过按下每个按钮各一次, 一共制作一百个弹珠, 那么你一开始时, 必须在盒子里放入多少个弹珠?

### Section C ( 6 marks each )

#### C 组 (每题 6 分)

21. Two identical tiles are arranged to overlap each other by 6 cm. The length of the whole arrangement is 30 cm. Find the length of a tile.

两块一样长的瓷砖排在一起时, 重叠部分的长是 6 cm, 总长度为 30 cm, 求一块瓷砖的长度是多少?



22. There are 10 stories in the “Fairy Tales”. Each of the stories consists of different number of pages from 1 to 10. If the first page of the story book started with one of the stories, every stories are started with new page, at most how many stories started with odd pages? What is the least number of stories that started with odd pages?

《童话故事书》里共有 10 篇故事，这些故事占的篇幅从 1 页到 10 页各不相同。如果从书的第 1 页开始印第一个故事，每一个故事总是从新的一页开始印，那么故事从奇数页起头的最多有几篇？最少有几篇？

23. Bottle A contained 549.5 ml of apple juice and bottle B contained 119.5 ml of apple juice.

After the same amount of juice was poured out from each bottle, bottle A contained 6 times as much apple juice as bottle B.

- (a) How much apple juice was poured out from each bottle?  
(b) How much apple juice is left in bottle A?

在瓶子 A 中，有 549.5 ml 苹果汁，瓶子 B 中有 119.5 ml 苹果汁。两个瓶子各倒出相同容量的果汁后，A 瓶子中的苹果汁是 B 瓶子的 6 倍。问：

- (a) 每个瓶子倒出了多少苹果汁？  
(b) 瓶子 A 还剩下多少苹果汁？

24. The height of the tallest student in class A is 142 cm. The height of the shortest student in the class is 134 cm. At least how many students are there in the class if at least 4 students are of the same height? Assume all heights to be in whole numbers.

A 班学生中最高的身高是 142 cm，最矮的学生身高是 134 cm。至少有 4 个学生的身高是一样的，那么这班学生至少有多少人？

25. Sometimes we use a 6-digit number to represent a date. For example, the number 181126 means November 26, 2018. In the 6-digit number from the left to the right, the first two numbers represent the year, the 3<sup>rd</sup> and the 4<sup>th</sup> numbers represent the month and the last 2 numbers represent the day. If we show dates of the year 2018 in this way, how many numbers consist of 6 different digits?

我们有时候习惯用 6 位数表示日期，如 181126 来表示 2018 年 11 月 26 日，即一个 6 位数从左到右第一和第二位数表示年，第三和第四位数表示月，第五和第六位数表示日，如果用这种方法表示 2018 年的日期，那么全年中 6 个数字都不相同的日期共有多少个？



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