

Malaysia International Mathematics Olympiad Competition 2016

TEAM CONTEST (MP)

School (学校) : _____ Student ID (编号) : _____

Name (姓名) : _____

1. Aladdin's Treasure: Known that in each box at most only has a gem, there is no gem in the box with number, and the number in the box indicates the number of gems that surround it

Eg.

A	D	1
B	2	F
C	E	G

This indicates that surrounding number 1, which is D or F has 1 gem.

A, B, C, D, E, F, G is surrounding number 2, will have 2 gems in total.

There are 10 gems hiding in the figure below. Please follow the rules above, use “▲” to identify the 10 gems out.

阿拉丁的宝藏：已知每个方格中最多只藏有一个宝石，写有数字的方格中没有宝石，而方格中的数字则代表它的周围所藏宝石的数量。

例如

A	D	1
B	2	F
C	E	G

表示 1 的周围 D、F 之中，有一个宝石。2 的周围 A、B、C、D、E、F、G 这 7 格中有 2 个宝石。

下面方格中藏有 10 个宝石，请依上述的规定，在有宝石的地方以 “▲” 表示出来。

		1				1	
1				3			
		4				3	
1				1			2
	1		1				
					1		
	2						
			3		1		

		1				1	
1				3			
		4				3	
1				1			2
	1		1				
					1		
	2						
			3		1		

Answer : _____

Malaysia International Mathematics Olympiad Competition 2016

TEAM CONTEST (MP)

School (学校) : _____ Student ID (编号) : _____

Name (姓名) : _____

2. In the 3x3 square box below, fill in the natural number from 1 to 9 with no repeat and without any number missing. Ensure that the sum of the 3 natural numbers in every column, row and diagonal are not equal. The number 1 and 5 had been filled in.

在 3×3 (三行三列) 的正方形方格中, 既不重复又不遗漏地填上 1—9 这 9 个连续的自然数, 使每行、每列、每条对角线上的三个自然数的和均不相等。其中, 数字 1 及 5 已填上。

1		
		5

1		
		5

Answer : _____

Malaysia International Mathematics Olympiad Competition 2016

TEAM CONTEST (MP)

School (学校) : _____ Student ID (编号) : _____

Name (姓名) : _____

3. If I multiply the two digits of a number, then add 19 and multiply the digits again, the answer is one less than the number I originally started with. What was the number I had originally thought of ?

若我将一个两位数的 2 个数码相乘，再加上 19，再将答案中的每个数码相乘，所得的答案比原来的这个两位数少 1。问：原来的两位数是多少？

Answer : _____

Malaysia International Mathematics Olympiad Competition 2016

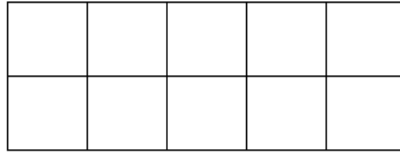
TEAM CONTEST (MP)

School (学校) : _____ Student ID (编号) : _____

Name (姓名) : _____

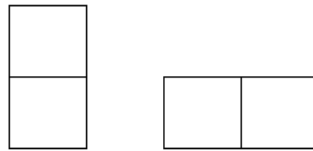
4. We need to make a rectangle with sides 2×5 from a small rectangle with sides 2×1 .

用边长为 2×1 的小长方形，组成一个边长为 2×5 的大长方形。



The 2×1 rectangles can be placed horizontally or vertically.

这个 2×1 的小长方形，可以置放成水平或直竖的方式。



How many ways can a 2×5 rectangle be formed?

有多少种不同的方式来组成 2×5 的长方形？

Answer : _____

Malaysia International Mathematics Olympiad Competition 2016

TEAM CONTEST (MP)

School (学校) : _____ Student ID (编号) : _____

Name (姓名) : _____

5. Find the smallest value of A such that the product of the following multiplication has four trailing zeroes : $972 \times 975 \times 935 \times A$

要使 $972 \times 975 \times 935 \times A$ 的乘积最后面有 4 个零, A 的最小值是多少?

Answer : _____

Malaysia International Mathematics Olympiad Competition 2016

TEAM CONTEST (MP)

School (学校) : _____ Student ID (编号) : _____

Name (姓名) : _____

6. Four colored balls are placed in a bag. One is green, one is red, and 2 are blue. Ai-Ling draws 2 balls from the bag and place one of them, which is blue, on a table. What are the chances the second ball Ai-Ling still has in her hand is the other blue ball ?

一个袋子里有 4 个球，一个是绿色，一个是红色，另外两个都是蓝色的。爱玲从中取出两个球，将其中的一个蓝色球放在桌上。问：爱玲手上的另外一个球也是蓝色的机会（概率）是多少？

Answer : _____

Malaysia International Mathematics Olympiad Competition 2016

TEAM CONTEST (MP)

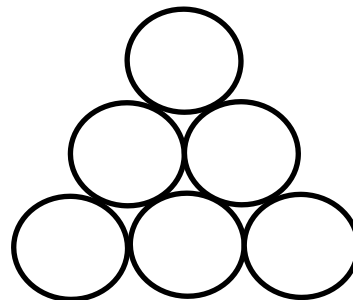
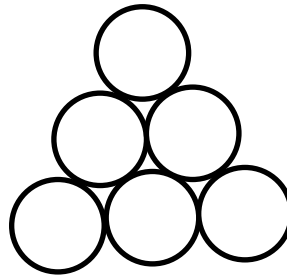
School (学校) : _____ Student ID (编号) : _____

Name (姓名) : _____

7. There are six small balls that were labelled as 2,4,5,6,8,10 arranging in the following figure. However , Mr.Chen asked the students to rearrange the balls according to the following rules, rearrange them. Please fill the correct answer in the circles. (All of the numbers fill in has to be correct to obtain the points)

有六个小球分别被标上 2, 4, 5, 6, 8, 10 排列成下图。但是陈老师要求学生按下面的规定, 将它们重新排列。请将正确答案填入圆圈中。(每个数的位置,全部要填对才有分)

- (1) Ball no.4 is neither adjacent to Ball no.5 nor Ball no. 6
4 号球与 5 号球和 6 号球不相邻
- (2) Ball no.8 is adjacent with another 4 balls.
8 号球和四个球相邻
- (3) Ball no.4 is at the right of Ball no.6
4 号球在 6 号球的右边
- (4) Ball no.10 is located on top of the two balls that give a total of 13.
10 号球在两个球加起来等于 13 的球的上面



Answer : _____

Malaysia International Mathematics Olympiad Competition 2016

TEAM CONTEST (MP)

School (学校) : _____ Student ID (编号) : _____

Name (姓名) : _____

8. There are 2016 piles of steel balls with the same appearance. In each pile, there are 2016 balls. It is known that among them, 2015 piles of balls are quality products and 1 pile of balls are defective products. A quality ball weighs 2016 mg each and a defective ball weighs 2017 mg each. How many times at least must the balls be weighed by a scale until the pile of the defective balls can be found?

有 2016 堆外表一样的钢球，每堆有 2016 个，已知其中 2015 堆是正品，一堆是次品，而正品钢球每个重 2016mg，次品钢球每个重 2017mg，那么用天平至少要称多少次，能把那堆次品找出来？

Answer : _____

Malaysia International Mathematics Olympiad Competition 2016

TEAM CONTEST (MP)

School (学校) : _____ Student ID (编号) : _____

Name (姓名) : _____

9. There is a small island, where the island has many aircraft. The performance of each aircraft is the same, and each aircraft's fuel tank is loaded with fuel enough for the aircraft to fly exactly half way around the earth, along a great circle. The fuel can be transferred by an aircraft to another aircraft during the flight. Aircraft's fuel can be obtained only from the island.

Assumption: The time of refuelling can be ignored, may it be on ground or in flight. To ensure an aircraft flying around the earth, what is the fewest numbers of aircraft need to be dispatched all the way?

Assume that the speed of the aircraft is always the same, the fuel consumption rate is the same, and all the aircraft must return safely to the island.

有一座小島，島上有許多架飛機。每架飛機的性能都一樣，而且每架飛機的油箱都裝載了供飛機環繞地球飛行半周（半圈）的油料。油料可以靠飛行中一架飛機給另一架飛機輸油的方式來傳遞。只有該島上可以獲得飛機的油料。假設：無論在地面還是在空中，加油都不占時間。要保證讓一架飛機環球飛行一周，至少需要出動多少架飛機？

假設飛機的速度始終不變，耗油率相同，而且所有飛機必須全部安全飛回到這個島上。

Answer : _____

Malaysia International Mathematics Olympiad Competition 2016

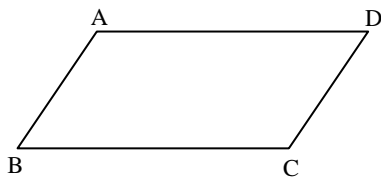
TEAM CONTEST (MP)

School (学校) : _____ Student ID (编号) : _____

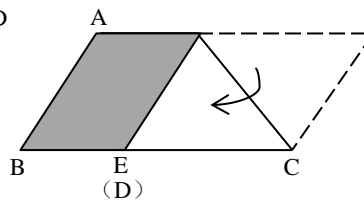
Name (姓名) : _____

10. Alice has a parallelogram paper (Figure 1), and she folds it down from the upper right corner as shown in Figure 2. The shaded area is $\frac{3}{8}$ of the original area. Alice then fold the bottom left corner again as shown in Figure 3. What is the fraction of the shaded area in figure 3, comparing to the original parallelogram area in figure 1?

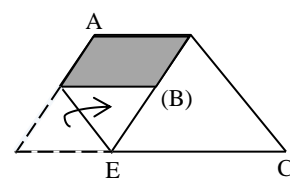
爱丽丝将一张平行四边形的纸（如图一），按图二的方式把它的右上角折叠起来，阴影部分的面积占原来面积的 $\frac{3}{8}$ 。爱丽丝再把左下角往上折叠成图三时，请问图三中的阴影部分的面积占原来平行四边形面积的几分之几？



(圖一) Fig. 1



(圖二) Fig. 2



(圖三) Fig. 3

Answer : _____