

Malaysia International Mathematics Olympiad Competition 2016



26th November, 2016 11.10 am – 12.10 pm - Middle Primary Paper-

TEAM CONTEST

Time: 60 minutes
Jointly Organised by:

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

> 马来西亚数学奥林匹克学会 黎明华文学校 力行国民型华文学校 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.
- Remember to write down your team name in the space indicated on every page.
- There are 10 problems in the Team Contest, arranged in increasing order of difficulty. Each question is printed on a separate sheet of paper. Each problem is worth 10 points. For all problems only numerical answers are required.
- The four team members are allowed 10 minutes to discuss and distribute the first 8 problems among themselves. Each student must attempt at least one problem. Each will then have 35 minutes to write the answers of their allotted problem independently with no further discussion or exchange of problems. The four team members are allowed 15 minutes to solve the last 2 problems together.
- No calculator or calculating device or electronic devices are allowed.
- Answer must be in pencil or in blue or black ball point pen.
- All papers shall be collected at the end of this test.

No.	1	2	3	4	5	6	7	8	9	10	Total	Sign by Jury
Score												
Score												











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
В	2	F
С	Е	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 "\(\blacktriangle \)" 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

Α	D	1
В	2	F
C	Е	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		

Angrian	•)	•		ĺ
Allswei	•						_









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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 ·				
							Answer ·				
							Answer ·				
							Δ newer \cdot	Δncwer ·	Δ ncwer \cdot	Δ newer :	Δ ncwer :
							Δ newer \cdot	Δ newer \cdot	Δ newer \cdot	Δ ncwer \cdot	Δ newer :
		/ X I I / N V V V / I	/ X I I / N V V V / I				Δ newer \cdot				
7 11 3 W/ 1 .1	(A) 11.3 W/C (1			(A) 11.3 W/C (1			Λncwar ·	Anguar ·	Ληςινος ·	Anguar ·	Anguar ·
A 118 W/ L.1	AUSWUI	ALISWU.	ALISWU.	AUSWUI	AIISWUI		Λησιμος	Anguar	Anguar :	Anguar ·	Anguar
A 11 S W C 1	AHSWEI	AHSWEL	AHSWEL	AHSWEI	A 11 S W/ C.1	A 11 V W C1	Λησιμον	Anguar	Anguar	Anguar	Anguar
AUSWEI	AUSWEI	AUSWEI	AUSWEI	AUSWEI	AIISWEI	A IIVW/FI	A 10 CITION .	A to control of	A norman	A norman	A nation .
AHSWEI	AHSWEI	AHSWEI	AHSWEI	AHSWEI	AIISWEI	A IIVW/PI	A 10 CTT 10 40 4	A 10 CYY 10 40 4	A 10 CYTY O 10	A norman	A norman
AUSWer	Answer	Auswer	Auswer	Answer	Answer	AIISWEL	A 44 CTT 1 A 4	A 40 CTT 1 C 40 A	A 40 CYTY 044 A	A 40 CYTY C44 A	A
Answer	Answer	Answer	Answer	Answer	Answer	Answer	A	A	A	A	A
Answer ·	Answer	Answer	Answer	Answer	Answer	Answer :		A	A	A	A
Answer :	Answer ·	Answer:	Answer:	Answer ·	Answer :	Answer :			A	A	A
Answer:	Answer ·	Answer:	Answer:	Answer ·	Answer:	Answer ·				A.	A
Answer ·	Answer ·	Answer ·	Answer ·	Answer ·	Answer ·	Answer ·					A
Answer ·	Answer ·	Answer:	Answer :	Answer ·	Answer ·	Answer ·					



School	(学校): _			 Student ID	(编号)	:
Name	(姓名): _			 		
3.		han the numb				gain, the answer had originally
			数码相乘,再加 : 原来的两位。	等答案中的每个	数码相乘,	所得的答案比
Α.						
A	nswer	•				









School (学校):	Student l	ID (编号):
Name (姓名):		
4. We need to make a rectangle with sid 用边长为 2×1 的小长方形,组成一个		ngle with sides 2×1.
The 2x1 rectangles can be placed ho 这个 2×1 的小长方形,可以置放成		
How many ways can a 2x5 rectangl 有多少种不同的方式来组成 2×5		
Answer:		





School (学校):		Student ID	(编 号):
Name	(姓名):		
5.	Find the smallest value of A such that the trailing zeroes : $972 \times 975 \times 935 \times A$	e product of the following	multiplication has four
	要使 972 × 975 × 935 × A 的乘积最后面	有 4 个零, A 的最小值是	多少?
	Answer:		



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?
Δ	answer :







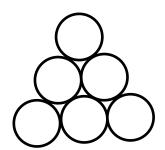


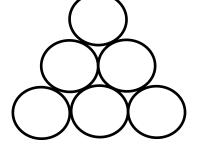
School (学校):	 Student ID	(编 号):	
Name (姓名):	 		

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:



School	(学校):				;	Student ID	(编号):	
Name	(姓名):							
8.	It is known defective peach. How	n that amon products. A	g them, 20 quality ball es at least m	15 piles of l l weighs 20	balls are q 16 mg eac	uality produc	ets and 1 pile etive ball wei	ghs 2017 mg
		个重 2016mg				Þ 2015 堆是正 〈用天平至少÷		

Answer:



(学校):				Stud	ent ID	(编号)	:	
(姓名):								
the same, and half way arou another aircra Assumption: 'an aircraft fly dispatched all Assume that t	each aircraft and the earth, ft during the The time of the ing around the way?	t's fuel ta , along a g e flight. A refuelling he earth, w	nk is loade great circle ircraft's fur can be ign what is the	d with fuel end. The fuel can be obtoored, may it fewest numes the same, the	nough for the nough for the trans ained on the on grund bers of a	or the aircra sferred by ly from the ound or in ircraft need	aft to fly e an aircraft island. flight. To d to be	xactly to ensure
机环绕地球飞 传递。只有该 保证让一架飞	行半周(半園 岛上可以获彳 机环球飞行-	圈)的油料 得飞机的油 一周,至少	斗。油料可 由料。假设 少需要出动	以靠飞行中一 : 无论在地面 多少架飞机?	-架飞机纟 面还是在	答另一架飞 空中, 加油	机输油的;	方式来
Answer								
	the same, and half way arou another aircraft an aircraft fly dispatched all Assume that t and all the air 有一座小岛, 机环境 尺有该 保证让一架 假设飞机的速	(姓名): There is a small island, where the same, and each aircraft half way around the earth, another aircraft during the Assumption: The time of an aircraft flying around the dispatched all the way? Assume that the speed of and all the aircraft must refer to the first of the	There is a small island, where the is the same, and each aircraft's fuel ta half way around the earth, along a ganother aircraft during the flight. A Assumption: The time of refuelling an aircraft flying around the earth, dispatched all the way? Assume that the speed of the aircra and all the aircraft must return safel 有一座小岛,岛上有许多架飞机。我机环绕地球飞行半周(半圈)的油料传递。只有该岛上可以获得飞机的流保证让一架飞机环球飞行一周,至少假设飞机的速度始终不变,耗油率材	(姓名): There is a small island, where the island has m the same, and each aircraft's fuel tank is loade half way around the earth, along a great circle another aircraft during the flight. Aircraft's fu Assumption: The time of refuelling can be ign an aircraft flying around the earth, what is the dispatched all the way? Assume that the speed of the aircraft is always and all the aircraft must return safely to the isl 有一座小岛,岛上有许多架飞机。每架飞机的机环绕地球飞行半周(半圈)的油料。油料可传递。只有该岛上可以获得飞机的油料。假设保证让一架飞机环球飞行一周,至少需要出动假设飞机的速度始终不变,耗油率相同,而且。	There is a small island, where the island has many aircraft. the same, and each aircraft's fuel tank is loaded with fuel e half way around the earth, along a great circle. The fuel car another aircraft during the flight. Aircraft's fuel can be obt Assumption: The time of refuelling can be ignored, may it an aircraft flying around the earth, what is the fewest num dispatched all the way? Assume that the speed of the aircraft is always the same, the and all the aircraft must return safely to the island. 有一座小岛,岛上有许多架飞机。每架飞机的性能都一样,机环绕地球飞行半周(半圈)的油料。油料可以靠飞行中一传递。只有该岛上可以获得飞机的油料。假设:无论在地话保证让一架飞机环球飞行一周,至少需要出动多少架飞机?假设飞机的速度始终不变,耗油率相同,而且所有飞机必须	There is a small island, where the island has many aircraft. The perf the same, and each aircraft's fuel tank is loaded with fuel enough for half way around the earth, along a great circle. The fuel can be tran another aircraft during the flight. Aircraft's fuel can be obtained on Assumption: The time of refuelling can be ignored, may it be on gr an aircraft flying around the earth, what is the fewest numbers of a dispatched all the way? Assume that the speed of the aircraft is always the same, the fuel coand all the aircraft must return safely to the island. 有一座小岛,岛上有许多架飞机。每架飞机的性能都一样,而且每步机环绕地球飞行半周(半圈)的油料。油料可以靠飞行中一架飞机线传递。只有该岛上可以获得飞机的油料。假设:无论在地面还是在保证让一架飞机环球飞行一周,至少需要出动多少架飞机?假设飞机的速度始终不变,耗油率相同,而且所有飞机必须全部安全	There is a small island, where the island has many aircraft. The performance of the same, and each aircraft's fuel tank is loaded with fuel enough for the aircraft may around the earth, along a great circle. The fuel can be transferred by another aircraft during the flight. Aircraft's fuel can be obtained only from the Assumption: The time of refuelling can be ignored, may it be on ground or in an aircraft flying around the earth, what is the fewest numbers of aircraft need dispatched all the way? Assume that the speed of the aircraft is always the same, the fuel consumption and all the aircraft must return safely to the island. 有一座小岛,岛上有许多架飞机。每架飞机的性能都一样,而且每架飞机的油机环绕地球飞行半周(半圈)的油料。油料可以靠飞行中一架飞机给另一架飞传递。只有该岛上可以获得飞机的油料。假设、无论在地面还是在空中,加油保证让一架飞机环球飞行一周,至少需要出动多少架飞机? 假设飞机的速度始终不变,耗油率相同,而且所有飞机必须全部安全飞回到这	There is a small island, where the island has many aircraft. The performance of each airc the same, and each aircraft's fuel tank is loaded with fuel enough for the aircraft to fly e half way around the earth, along a great circle. The fuel can be transferred by an aircraft 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 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 and all the aircraft must return safely to the island. 有一座小岛,岛上有许多架飞机。每架飞机的性能都一样,而且每架飞机的油箱都装载机环绕地球飞行半周(半圆)的油料。油料可以靠飞行中一架飞机给另一架飞机输油的设备递。只有该岛上可以获得飞机的油料。假设:无论在地面还是在空中,加油都不占时保证上一架飞机环球飞行一周,至少需要出动多少架飞机? 假设飞机的速度始终不变,耗油率相同,而且所有飞机必须全都安全飞回到这个岛上。





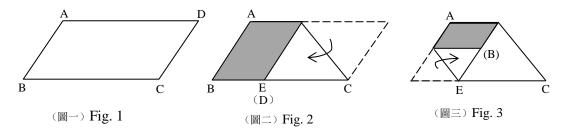




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Name (姓名):				

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?



Answer: