

Taiwan International Mathematics Competition 2012 (TAIMC 2012)

World Conference on the Mathematically Gifted Students
---- the Role of Educators and Parents
Taipei, Taiwan, 23rd~28th July 2012



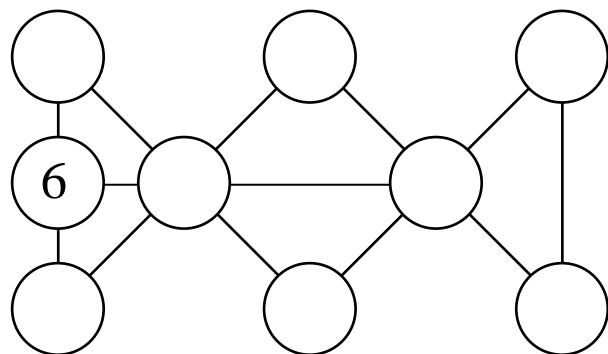
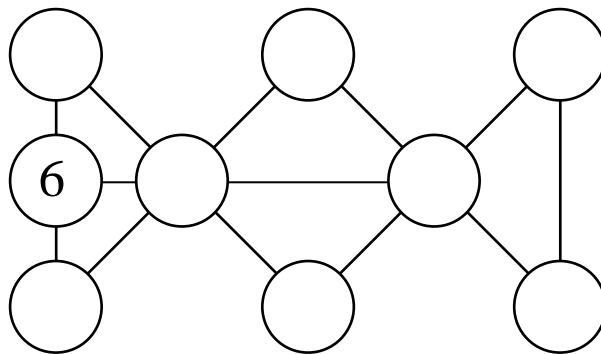
Elementary Mathematics International Contest

队际赛试题

25th July 2012 Taipei, Taiwan

队名: _____ 得分: _____

1. 下面的九个圆圈中各填有一个不同的正整数，其中八个数已经被擦掉。这九个整数是连续的，且每条直线（图中共有 7 条）上的所有圆圈中的数之和都为 23。右上角的圆圈中的数小于右下角的圆圈中的数。请重新填上空白圆圈中的数。

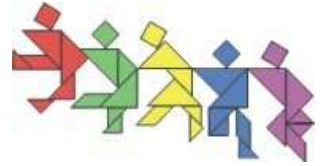


Answer: _____



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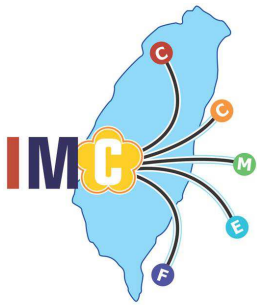
2. 一块水泥板上面画有一个数字表格，其中一部分如左下图所示。表格的第一列是从 0 开始的连续整数。表格的第一行从第二个数开始，每个数等于前面那个数加 1；第二行从第二个数开始，每个数等于前面那个数加 2；依此类推。水泥板掉到地上摔成碎片，其他碎片已经被清扫掉，只留下两块如右下图所示的碎片（放大显示），每块碎片上都有一个方格上的数涂污了，请问这两个方格中的数之和为多少？

0	1	2	3	4	5	
1	3	5	7	9	11	
2	5	8	11	14	17	
3	7	11	15	19	23	
4	9	14	19	24	29	
5	11	17	23	29	35	

?	2012	2023
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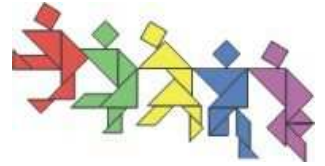
2012
2683
?

Answer: _____



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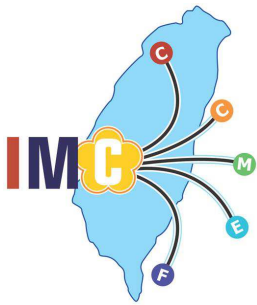
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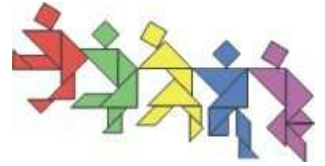
3. 有一列数，每个数是 2012 或者 1，其中第一个数是 2012。第一个 2012 与第二个 2012 之间恰好有一个 1；第二个 2012 与第三个 2012 之间恰好有两个 1；第三个 2012 与第四个 2012 之间恰好有三个 1；依此类推。请问这列数的前 2012 个数之和为多少？

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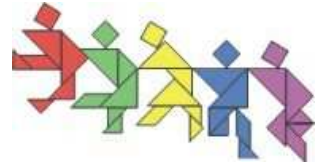
4. 在一次考试中，小明答错了三分之一的题目，小亮答错了 7 道题。有五分之一的题目他们俩都答错了。请问他们俩都答对的题目至多有几题？

Answer: _____



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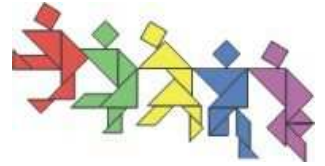
5. 五个互不相同的正整数两两相乘得到 10 个乘积，其中最小的乘积为 28，最大的乘积为 240，且 128 也是其中一个乘积。请问这五个整数之和为多少？

Answer: _____



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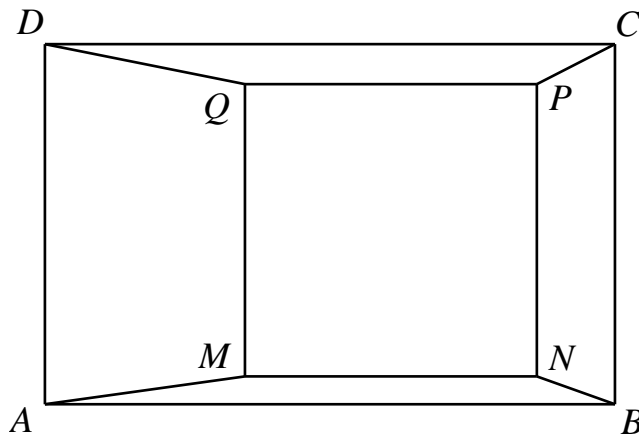
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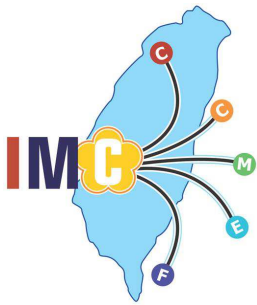
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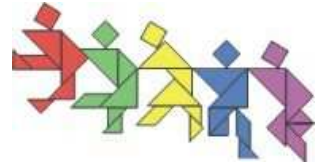
6. 如下图所示，正方形 $MNPQ$ 在长方形 $ABCD$ 内，且长方形的边与正方形的边平行， $AB - BC = 7$ cm。如果梯形 $ABNM$ 与 $CDQP$ 的面积之和为 123 cm^2 ，且梯形 $ADQM$ 与 $BCPN$ 的面积之和为 312 cm^2 。
- 请问正方形 $MNPQ$ 的面积为多少 cm^2 ？





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7. 有两家公司的员工数量相同, 后来第一家公司招聘了一些新员工使得它的员工数量是原来的 11 倍。第二家公司辞退了 11 名员工, 经过这个调整后, 第一家公司的员工数量是第二家公司的员工数量的整倍数。

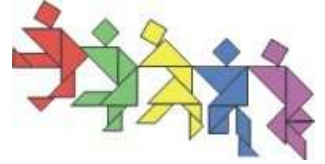
请问第一家公司原本至多有多少员工?

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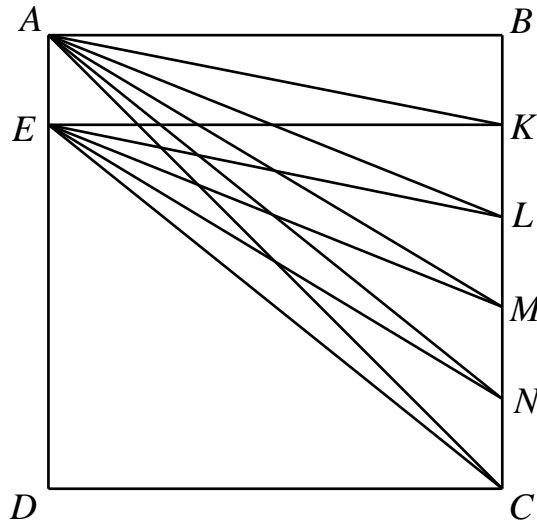
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8. 在正方形 $ABCD$ 中, 点 K, L, M 和 N 在 BC 边上且 $BK = KL = LM = MN = NC$, 点 E 在 AD 边上且 $AE = BK$ 。请问

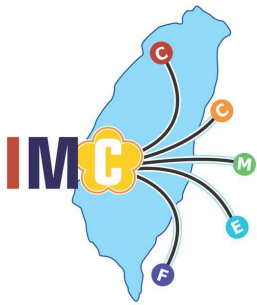
$$\angle AKE + \angle ALE + \angle AME + \angle ANE + \angle ACE$$

为多少度?



o

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9. 如下图所示，数 1 和 8 已经填入 3×3 表格的两个方格中，把数 2、3、4、5、6、7 和 9 分别填入剩下的七个方格中，每个数仅填一次且每个方格仅填一个数，使得每个 2×2 表格（如下图的阴影部分）中的之和都相等。请求出所有的填法。

1		
		8

1		
		8

1		
		8

1		
		8

1		
		8

1		
		8

1		
		8

1		
		8

1		
		8

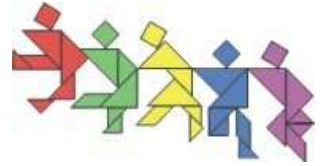
1		
		8

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10. 在每个月开始，一只成熟的红色蚂蚁生出 3 只黑色幼蚁，一只成熟的黑色蚂蚁吃掉 1 只黑色幼蚁并生出 3 只红色幼蚁，然后这只成熟的黑色蚂蚁死掉（已知每个月都会有足够多的黑色幼蚁让成熟黑蚁吃掉）。过了一个月，幼蚁都成了成熟的蚂蚁，如此不断持续下去。如果今年的圣诞节有 9000000 只红色蚂蚁和 1000000 只黑色蚂蚁，请问去年圣诞节时红色蚂蚁与黑色蚂蚁的数量之差是多少？

Answer: _____