Po Leung Kuk

3rd Primary Mathematics World Contest

Problems for Team Contest

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Team Problem

1. The fraction $\dfrac{44}{37}$ can be written in the form of $1 + \cfrac{1}{x + \cfrac{1}{y + \cfrac{1}{z}}}$, where x, y and z are distinct integers. Find the value of $x + y + z$.

2. A story is told that Pythagoras once threatened to punish one of his students by making him walk backwards and forwards in front of the 7 pillars of the Temple of Diana (labelled as A, B, C,..., G) until he had counted up to 1999 pillars, unless he could reason out which pillar was the 1999th pillar. Could you help him escape the punishment ? Find the 1999th pillar?

| A	B	C	D	E	F	G
□	□	□	□	□	□	□
1	2	3	4	5	6	7
13	12	11	10	9	8	
	14	15	16	17	18	19
					20	
	..	..	..	..		
	..	..	..	..	..	..
..	..	..	..	..	..	

3. 99 apples are divided among a number of children so that each child gets at least one apple and all children get a different number of apples. How many children are there at the most?

4.   A furniture store sold 213 beds during the year 1998. At first they sold 25 beds per month, then 16 beds per month and finally 20 beds per month. During how many month(s) did they sell 25 beds per month?

5.   Place the numbers 1, 2, ..., 9 in each of the nine regions (one number in each region) formed by the five circles as shown in the following figure so that the sum of the numbers inside each circle is the same.
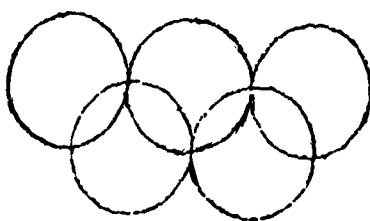
6.   In the figure, 5, 8 and 10 are respectively the area of the three triangles enclosing the numbers. What is the area of the quadrilateral enclosing the number X ?
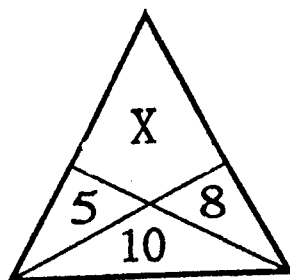
7.   The speed of athlete A and athlete B are 140 m per minute and 100 m per minute respectively on a flat road. However, their speeds are increased by 20m per minute when they go down a slope and decreased by 20 m per minute when they go up a slope. They start from a slope top at the same time to run back and forth between the slope top and the slope bottom. If the distance between the location where they meet face to face at the third time and the location where athlete A catches up with athlete B at the third time is 200m, then what is the distance between the slope top and the slope bottom?

8. The product of $1 \times 4 \times 7 \times 10 \times \ldots \times 1999$ can be expressed in the form of $7^a \times 10^b \times A$ where a, b and A are positive integers. Find a + b if a and b are as large as possible.

. Find all the four-digit numbers having the following properties :
(i)   It is a square.
(ii) Its first two digits are the same.
(iii) Its last two digits are the same.

10. A teacher gives a three-digit number N to five students A, B, C, D and E. The following conversation takes place :

Student A: The number is divisible by 27.
Student B : The number is divisible by 11.
Student C : The sum of all the digits of the number is 15.
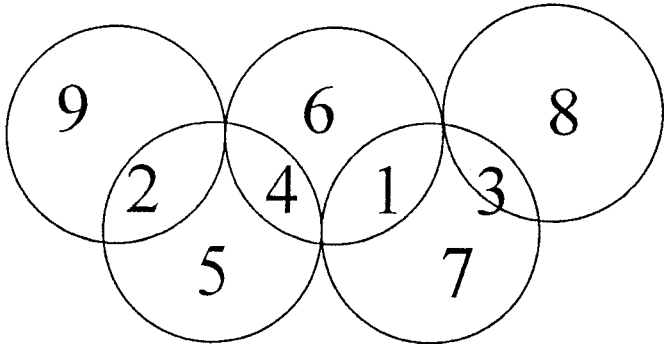Student D : The number is a perfect square.
Student E : The number divides 648 000 exactly.

Only 3 of these 5 sentences are true. Find N.

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Problem	Answer
1.	10
2.	Pillar G
3.	13
4.	1
5.	Sum=11or 13or 14
6.	22
7.	400m
8.	277
9.	7744
10.	324