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Po Leung Kuk

17th Primary Mathematics World Contest

Team Contest 2014

Team: _____

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1. What is the maximum number of different positive integers that can be added to give a total of 2014?

Answer : _____

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2. Replace each star with one of the digits 1, 2, 3, 4, 5, 6, 7 and 8 in the equation below. Each digit must be used exactly once. Give one possible solution.

$$\frac{*}{*} + \frac{*}{*} = \frac{*}{*} + \frac{*}{*}$$

Answer : $\frac{\square}{\square} + \frac{\square}{\square} = \frac{\square}{\square} + \frac{\square}{\square}$

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3. An integer N is formed by writing the integers from 1 to 50 in order. That is N = 123456789101112 … 484950. Some digits are removed from N to form a new integer such that the sum of the digits of the new number is 200. If M is the largest number that can be formed in this way, what are the first ten digits of M?

Answer : _____

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4. Tom is asked for the last digit of $1^1+2^2+3^3+\ldots+1007^{1007}$. Jack is asked for the last digit of $1008^{1008}+1009^{1009}+1010^{1010}+\cdots+2014^{2014}$. What is the sum of the digits that Tom and Jack found?

Answer : _____

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5. It is known that in the numbers A and B each digit is larger than the digit to its left. $A^2 = B$ and B is a six-digit number. What is the number A?

Answer : _____

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6. Pooky writes down all the positive integers which have a sum of the digit(s) equal to 9 in increasing order: 9, 18, 27, 36,…
What is the 2014th number in this list?

Answer : _____

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7. Let point K lie on the side AB and point M lie on the side BC of triangle ABC such that $\frac{AK}{KB} = \frac{BM}{MC} = \frac{2}{1}$. AM intersects CK at point T, and BT intersects AC at point N. What is the area of triangle ATN, in cm^2, if the area of triangle AKT is 20 cm^2?

Answer : _____ cm^2

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8. Choose five different digits from 0 to 9 to form a five-digit number such that the number formed is a multiple of 495. (The first digit **cannot** be zero.) How many such numbers are there?

Answer : _____

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9. Gary writes the digits '1' to '9' into the cells of a 3×3 square such that the sum of each row is 15 and the sum of each column is 15 (the diagonals do not necessarily add up to 15). The square is shown below and the digits are represented as letter '*A*' to '*I*'.

A	*B*	*C*
D	*E*	*F*
G	*H*	*I*

Three students guess two digits in this square as follows:
- *Peter* guesses "$A = 2$" and "$C = 9$".
- *Tom* guesses "$E = 5$" and "$F = 8$".
- *Sam* guesses "$G = 3$" and "$H = 7$".

Gary notes that one student guesses correctly for both digits, one student guesses only one digit correctly and one student guesses wrong for both digits. Find the product of $B \times D \times F \times H$.

Answer : _____

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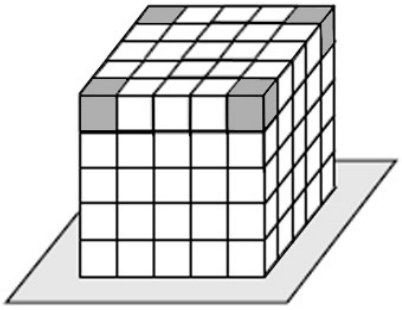
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10. The 125 unit-cubes are formed into a large 5×5×5 cube which is placed on a table as shown in the figure.

    Step 1: If at least 3 sides of any unit-cube can be seen, all those cubes must be removed. e.g. the four top shaded cubes are removed.

    Step 2 to step 5: This process is repeated on the new solid.

    After step 5, how many unit-cubes still remain in the solid?



Answer : _____