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Po Leung Kuk

17th Primary Mathematics World Contest

Individual Contest 2014

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1. The LCM of a and b is 9800. The LCM of a and c is 2200. The LCM of b and c is 539. Find each of the numbers a, b and c.

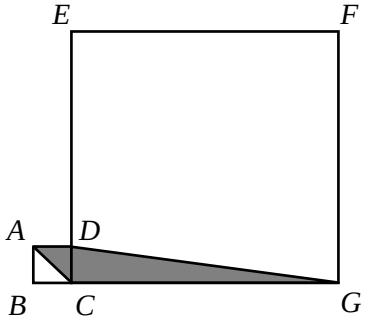
2. The numbers A, B, C, D, E, F, G and H form an arithmetic sequence. The sum of the two middle numbers (D and E) is 16. What is the sum of these eight numbers?
(In an arithmetic sequence, each number, after the first one, is obtained by adding the same amount to the previous number.)

3. There are five consecutive positive integers, $a < b < c < d < e$. It is given that $b+c+d$ is a perfect square and $a+b+c+d+e$ is a perfect cube. What is the smallest possible value of c ?

4. Given $\overline{abcd}$ and $\overline{efgh}$ are both four-digit numbers (a, b, c, d, e, f, g and h are all different digits) such that $\overline{abcd} - \overline{efgh} = 2014$. Write down one possible solution on the answer sheet.

5. What is the largest six-digit number, $\overline{x2014y}$, that is divisible by 33?

6. Two squares $ABCD$ and $CGFE$ are joined as shown in the figure, the ratio of the shaded areas ACD to CGD is 1:7, what is the ratio of the unshaded areas ABC to $EDGF$?



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7. On a particular day, a cyclist left town A at 9:00 AM and arrived in town B at 12:40 PM. On the same day, a motorcyclist left town A at 10:00 AM and arrived in town B at 12:00 PM. Given that they were both travelling at a constant speed, at what time of the day did the motorcyclist meet the cyclist?

8. The sum of the reciprocals of four positive integers a, b, c and d (not necessarily different) is $\frac{7}{10}$, i.e. $\frac{1}{a} + \frac{1}{b} + \frac{1}{c} + \frac{1}{d} = \frac{7}{10}$. What is the smallest possible sum of these four integers?

9. Alex must take the sum of 11 consecutive positive integers. But he is very careless and misses two consecutive numbers and gets a total of 9832. What total would he get if he counted correctly?

10. In a mathematics contest, 100 students had to solve four problems. No student solved all four problems. The first problem was solved by 90 students, the second problem was solved by 80 students, the third problem was solved by 70 students and the fourth problem was solved by 60 students. How many students solved both the third and fourth problems?

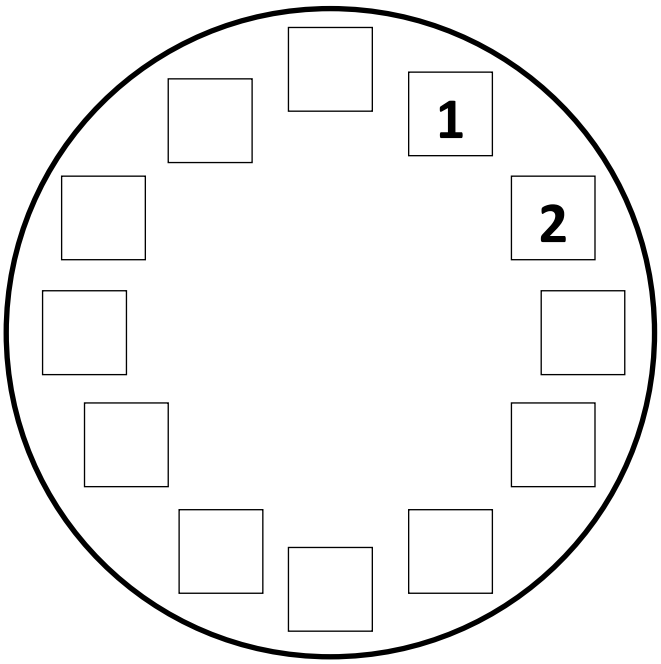
11. If the five numbers, $2^{147} \times 6^{49}$, $3^{98} \times 5^{49}$, $5^{98} \times 2^{49}$, 7^{98} and $128^{7} \times 23^{49}$, are arranged in ascending order, which number will be in the middle?

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12.



The positive integers 1 to 12 are placed in boxes around a circle. For any three consecutive boxes A, B and C, box B is between box A and box C on the circle. The numbers in the boxes A, B and C are a, b and c respectively. It is given that $b^2 - a \times c$ (not necessarily positive) is a multiple of 13. The numbers 1 and 2 have already been placed. Now place the numbers 3 to 12 in the rest of the boxes.

13. The positive integers m and n satisfy the identity $(m+6n)(n+6m)=2014$. Find the largest possible value of m.

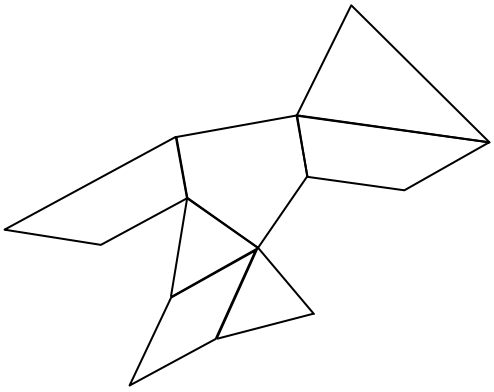
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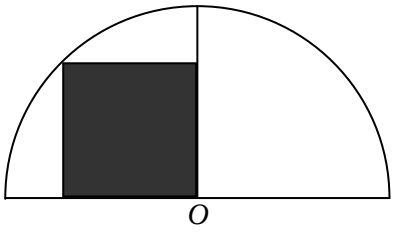
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14. The figure below represents the net of a solid, once the solid is formed how many vertices will it have?



15. Area of the shaded square region is 8 cm^2. Find the area of the semi-circle where *O* is the centre of the full circle.
{Take $\pi = 3.14$}



~The end ~