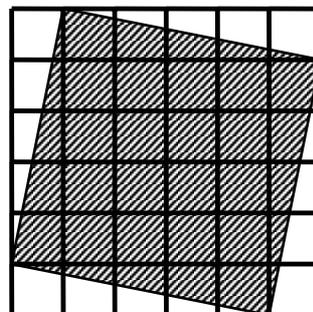


**INTERNATIONAL MATHEMATICS AND SCIENCE OLYMPIAD
FOR PRIMARY SCHOOLS (IMSO) 2005
Mathematics Contest in Taiwan, Short Answer Problems**

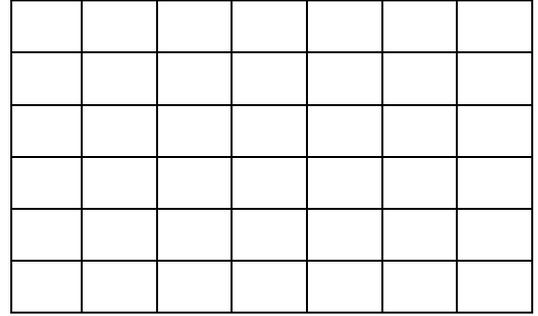
Name: _____ **School:** _____ **Grade:** _____ **ID number:** _____

Short Answer: there are 20 questions, fill in the correct answers in the answer sheet. Each correct answer is worth 2 points. Time limit: 60 minutes.

1. A foundation has allocated a certain amount of money for 1st, 2nd and 3rd prizes in a competition. The money is divided in the ratio of 3 : 2 where the larger amount is for the 1st prize and the smaller amount is divided again in the ratio of 3 : 2 for the 2nd and 3rd prizes respectively. It becomes known that the 3rd prize is \$3300 less than the first prize. How much is the 2nd prize?
2. Three man and three children arrive at the river where there is a small boat that will hold one adult or two children. What is the minimum number of trips across the river in either direction to get the family across?
3. Mr. Sun has a broken calculator. When just turned on, it displays 0. If the + key is pressed, it adds 35. If the - key is pressed, it subtracts 35. If the \times key is pressed, it adds 91. If the \div key is pressed, it subtracts 91. The other keys do not function. Mr. Sun turns the calculator on. What is the number closest to 2005 that he can get using this calculator?
4. There are 500 unit cubes. As many of these cubes as needed are glued together to form the largest possible cube which looks solid from any point on the outside but is hollow inside. What is the side length of the largest cube?
5. What is the ratio of the shaded square to that of the largest square shown in the diagram?
6. A three-digit number N leaves remainder 3 when divided by 7, remainder 5 when divided by 11 and remainder 8 when divided by 17. What is the number N ?



7. How many rectangles are there in this grid, where vertices are points of the grid and the edges are lines of the grid?



8. A six digit number is represented by \overline{abcdef} , where a, b, c, d, e and f are its digits. If this number is multiplied by 6, the result is \overline{defabc} . What is this six digit number?

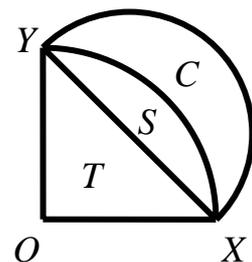
9. If a, b, c and d are positive integers such that

$$a + \frac{1}{b + \frac{d}{c}} = \frac{2005}{101}.$$

What is the value of $a+b+c+d$?

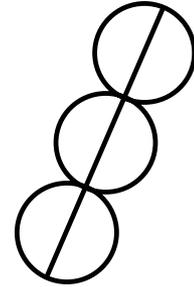
10. Alan has a stride 75 cm. If he travels by walking 5 steps forward and one step back, what is the least number of steps he needs to reach a spot 24 metres away?
11. N is a positive integer such that N and $N + 97$ are both perfect squares. What is the positive integer N ?
12. Five students sit for an exam which has a maximum score of 100. The average of the five scores achieved by the students in the exam was 89. What could the minimum score be gained?

13. In Figure, $OX=OY=10$ are radii of a circular quadrant. A semi-circle is drawn on XY as shown. T, S and C denote the resulting triangles, segment and crescent. What is the area of C ?

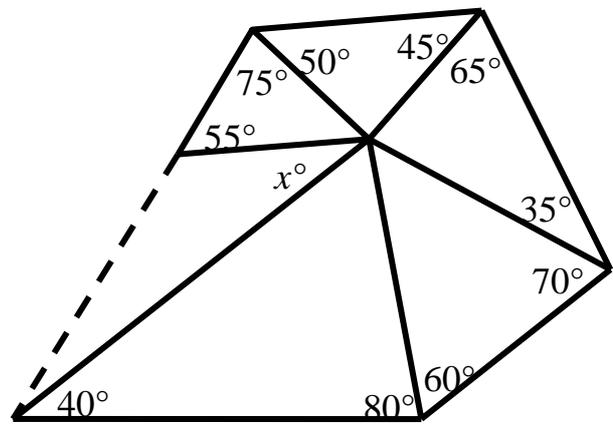


14. A large watermelon weighs 12 kg, with 97% of its weight being water. It is left to stand in the sun, and some of the water evaporates so that now only 90% of its weight is water. What does it now weigh?

15. What is the number of lines of symmetry in the plane of the diagram?

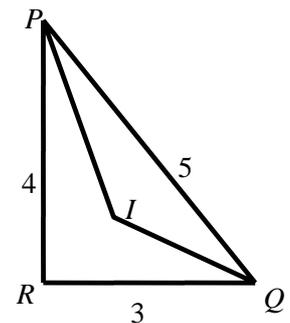


16. What is the value of x in the diagram?



17. When $10^{2005} - 2005$ is expressed as a single number, what is the sum of the digits?

18. The length of the sides of a triangle PQR are $PQ=5$, $QR=3$ and $RP=4$. The bisectors of the angles P and Q meet at the point I . What is the area of the triangle PQI ?



19. A cube with edge of length 10 is painted. The cube is then divided into 1000 unit cubes. Among these small cubes, how many cubes which have one or two painted faces?

20. In the 5×5 square the numbers 1, 2, 3, 4 and 5 are arranged in such a way that every number occurs precisely once in each column. In the 5×5 square shown, what is the entry in the position marked with ?

1	2			
				1
		4		
2		5		
	5			4