

# INTERNATIONL MATHEMATICS AND SCIENCE OLYMPIAD FOR PRIMARY SCHOOLS (IMSO) 2007

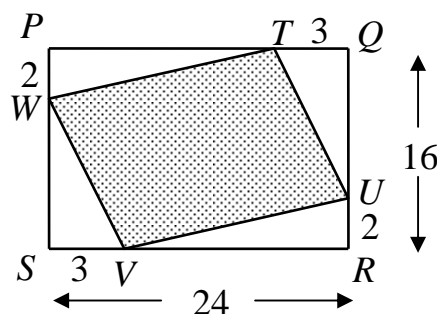
## Mathematics Contest in Taiwan

Name: \_\_\_\_\_ School: \_\_\_\_\_ Grade: \_\_\_\_\_ number: \_\_\_\_\_

**Short Answer:** there are 12 questions, fill in the correct answers in the answer sheet. Each correct answer is worth 10 points. Time limit: 90 minutes.

- The fraction  $\frac{2007}{7000}$  is written as a decimal. What digit is in the 2007<sup>th</sup> place?  
(For example: In the decimal 0.23456 the digit 4 is in the 3<sup>rd</sup> place.)

- The rectangle  $PQRS$  measures 24 cm by 16 cm. Points  $T$ ,  $U$ ,  $V$  and  $W$  are on the sides with measurements, in centimeters, as shown. Find the area, in square centimeters, of shaded portion.

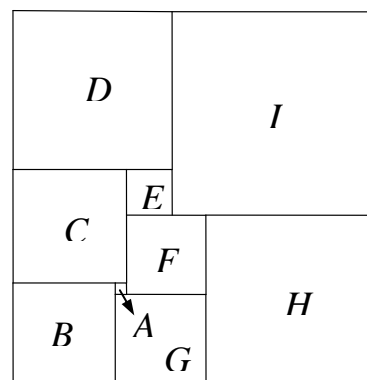


- Mary's brother and grandmother both died young. The sum of their lifespans equaled 78 years. Mary's brother died 99 years after their grandmother was born. How many years after their grandmother died was Mary's brother born?

- What would be the third number from the left of the 75<sup>th</sup> row of the accompanying triangular number pattern?

			1			
		2	3	4		
	5	6	7	8	9	
10	11	12	13	14	15	16
			⋮			

- Nine squares are arranged as shown. If square  $A$  has area  $4 \text{ cm}^2$  and square  $B$  has area  $324 \text{ cm}^2$ , then what is the area of square  $I$ , in square centimeters?



- Suzanne has 20 coins in her purse. They are \$10, \$20 and \$50 coins and the total value of the coins is \$500. If she has more \$50 than \$10 coins, how many \$10 coins she has?

7. Each of faces of a regular octahedron is numbered with a different integer. Each vertex is assigned a “vertex number” which is the sum of the numbers on the faces which intersect in that vertex and then the sum of the vertex numbers is calculated. What is the highest number which must divide this sum, for every possible numbering of the faces?

8. The number 119 is very curious:

When divided by 2 it leaves a remainder of 1.

When divided by 3 it leaves a remainder of 2.

When divided by 4 it leaves a remainder of 3.

When divided by 5 it leaves a remainder of 4.

When divided by 6 it leaves a remainder of 5.

How many 4-digit numbers have this property?

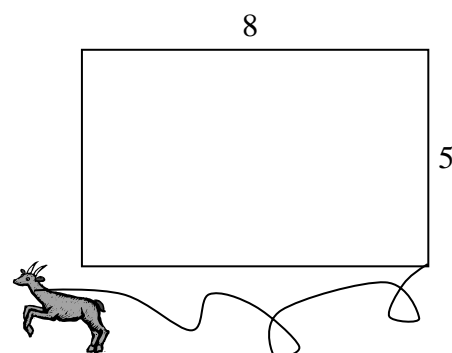
9. In the right multiplication example, all number from 1 through 9 have been used once, and once only. Three of the numbers are given. Can you fill in the rest?

$$\begin{array}{r} 2 \square \square \\ \times \quad \square 8 \\ \hline 5 \square \square \square \end{array}$$

10. The diagram shows a 5 by 5 table. The top row contains the symbols  $A$ ,  $B$ ,  $C$ ,  $D$  and  $E$ . The fourth row contains the symbols  $A$ ,  $B$  and  $C$  at the centre. The remaining squares can be filled with  $A$ 's,  $B$ 's,  $C$ 's,  $D$ 's and  $E$ 's such that no row, column or diagonal contains the same symbol more than once. What is the symbol that must go into the shaded square?

$A$	$B$	$C$	$D$	$E$
	$A$	$B$	$C$	

11. A goat is tied by a rope to a corner of a rectangular shed as shown. The shed is 8 metres long and 5 metres wide and the rope is 10 metres long. The shed is surrounded by grass. What is the area, in square metres, that the goat can graze upon? (The ratio of the circumference of the circle to the diameter is  $\pi = 3.14$ .)



12. The accompanying diagram is a road plan of a city. All the roads go east-west or north-south, with the exception of the one short diagonal road shown. Due to repairs one road is impassable at the point  $X$ . Of all the possible routes from  $P$  to  $Q$ , there are several shortest routes. How many such shortest routes are there?

