

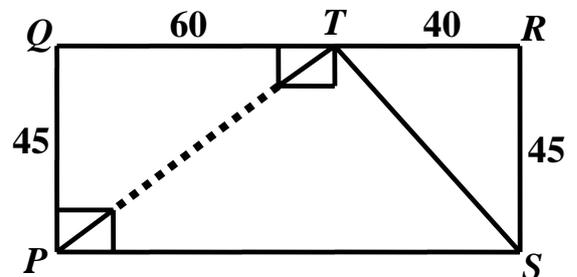
**INTERNATIONAL MATHEMATICS AND SCIENCE OLYMPIAD
FOR PRIMARY SCHOOLS (IMSO) 2005
Mathematics Contest in Taiwan, Essay Problems**

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

Answer the following 10 questions, and show your detailed solution in the space provided after each question. Each question is worth 4 points.

Time limit: 60 minutes.

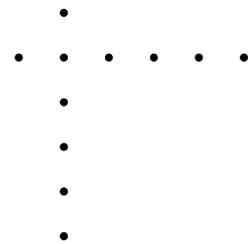
1. A rectangle $PQRS$ with $PQ = 45$ and $PS = 100$ is cut into 4500 squares of side 1. T is a point on QR such that $QT = 60$. Of these 4500 squares, how many are cut by lines PT and TS ? (A square does not cut by line if the line only passing through its vertices.)



2. In a mathematical competition consisting of 25 problems, 8 marks are given for each correct response, 0 marks for each incorrect response and each no response is awarded 3 marks. Tom scored 121 marks in this competition. What is the smallest number of incorrect responses he could have?

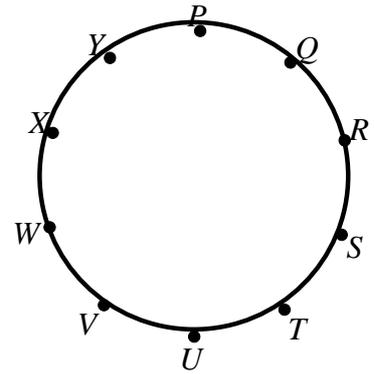
3. How many numbers less than 1000 have the product of their digits equal to 63?

4. How many triangles can be drawn using the points in the diagram as vertices?



5. The integers 1, 2, 3, ..., 2005 are written on the board. What is the smallest number of these integers that can be wiped off so that the product of the remaining integers ends in 8?

9. Ten points, P, Q, R, \dots, Y , are equally spaced around a circle of radius one. What is the difference in the lengths of the lines PQ and PS ?



10. In figure, PQR is equilateral triangle with $PR=RQ=PQ=5$. If $PL=RN=QM=1$, what is the ratio of the area of the triangle LMN to the triangle PQR ?

