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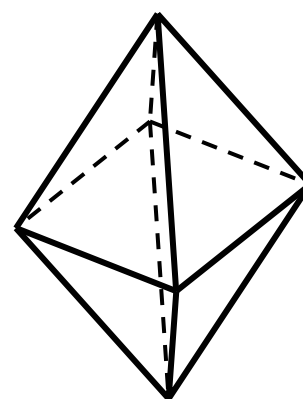
**INTERNATIONL MATHENATICS AND SCIENCE OLYMPIAD  
FOR PRIMARY SCHOOLS (IMSO) 2005  
Mathematics Contest in Taiwan**

**Name:** \_\_\_\_\_ **School:** \_\_\_\_\_ **Grade:** \_\_\_\_\_ **ID 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.**

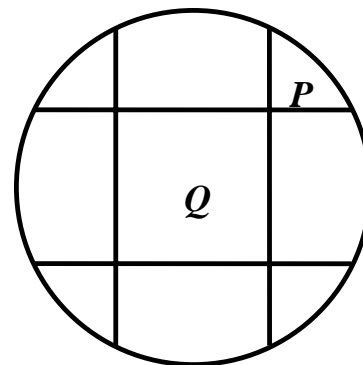
1. How many of the first 20 positive whole numbers can be expressed as the sum of two different primes? (Note that 1 is not a prime.)

2. An ant sits at a vertex of an octahedron with edge length 1 *m*. The ant moves along the edges of the octahedron and comes back to the original vertex without visiting any other point twice. What is the length of the longest such journey?



3. When 2005 is divided by a positive integer  $N$ , the remainder is 10. What is the number of all possible values of  $N$ ?

4. Each of the four chords in the diagram cuts the area of the circle in the ratio 1 : 3. The points of intersection of these chords are the vertices of a square. What is the ratio of the area of region  $P$  to the area of region  $Q$ ?

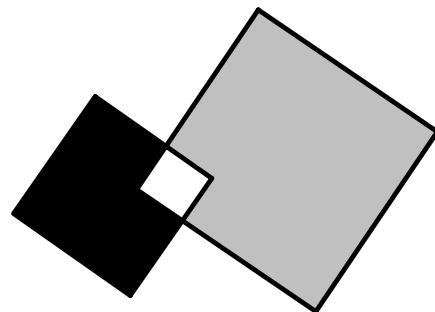


5. The number of positive integers  $N$  that is 17 times the sum of its digits. Find  $N$ .
6. There are 64 football teams play in a tournament. They are first divided into 8 groups, each of eight teams. In each group play in a knockout tournament (When a team loses a game it is eliminated). The best of each group then plays each other once to decide the overall winner. How many matches must be played?

7. If a car runs at 60 km/h, it completes a certain distance in 18 minutes. At what average speed, in kilometers per hour, would this car need to cover the same distance in 15 minutes?

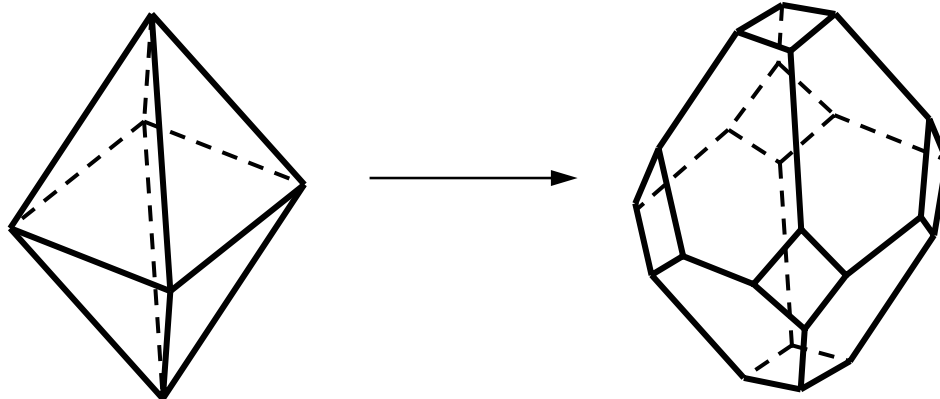
8. In the diagram is made from two overlapping squares.

The lighter shaded area comprises  $\frac{73}{75}$  of the larger square and darker area  $\frac{14}{15}$  of the smaller square. What is the ratio of the area of the smaller square to the area of the larger square?



9. From four numbers, three are chosen, averaged and the fourth one added. This can be done four ways, leaving out a different number each time. The four results are 64, 70, 78 and 84. What is the largest of the original numbers?

10. An octahedron has all its corners cut off as shown.



How many edges does the new shape have?

11. What are the last 5 digits of the sum

$$3 + 33 + 333 + \cdots + \underbrace{333 \cdots 333}_{2005 \text{ digits}} ?$$

12. What is the smallest number of 6 cm by 8 cm rectangles which can be fitted together to make a large rectangle with sides in the ratio 5 : 3 ?