



保良局

PO LEUNG KUK

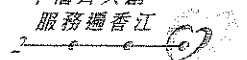
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Po Leung Kuk 5<sup>th</sup> Primary Mathematics World Contest  
Individual Contest

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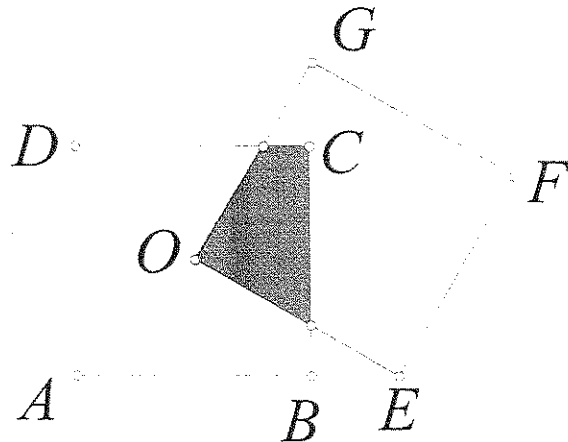


# PO LEUNG KUK

## 5<sup>th</sup> Primary Mathematics World Contest PMWC

### INDIVIDUAL CONTEST

1. Find the whole number which becomes a perfect square when decreased by 4 and also when increased by 15.
2. How many 4-digit positive integers are there such that the product of their digits is a prime number? (1 is not a prime number.)
3.  $ABCD$  and  $OEF G$  are two identical squares.  $O$  is the centre of the square  $ABCD$ . Find the area of the shaded region if  $\angle EOB = 22.5^\circ$  and  $AB = 1$  cm.



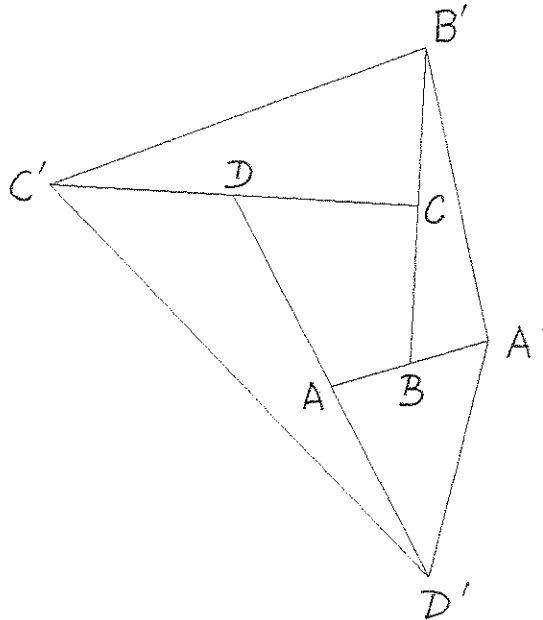
4. Two trains start at the same time, one from A to B and the other from B to A. If they arrive at B and A respectively 3 hours and 12 hours after they passed each other, find the ratio between their speeds.
5. Find a two digit number such that if it is reduced by 5, it is a multiple of 4, if it is reduced by 6, it is a multiple of 5 and if reduced by 7 it is a multiple of 6.
6. All the angles of a hexagon are 120 degrees and four consecutive sides have lengths of 5, 7, 4, and 6 units. Find the sum of the lengths of the other two sides.
7. There are 2001 pupils standing in a line. From the beginning to the end, they count off numbers from 1 to 3 (1, 2, 3, 1, 2, 3, ...). Then, from the end to the beginning, they count off from 1 to 4 (1, 2, 3, 4, 1, 2, 3, 4, ...). How many pupils say 1 twice?

8. One digital clock displays in format of hh:mm:ss (2 digits for the hour, 2 digits for the minute and 2 digits for the second) and in 24 hours format. One example is

01:20:12

Notice that the first three digits are the same as the last three digits and in the same order. How many times in twenty four hours does this happen? (After 23:59:59, it comes to 00:00:00, after 11:59:59, it comes to 12:00:00)

9. ABCD is a parallelogram. P,Q,R,S are points on sides AB, BC, CD, DA respectively such that  $AP = DR$ . If the area of the parallelogram ABCD is  $16\text{cm}^2$ , find the area of the quadrilateral PQRS.
10. When 24, 56, 104 are divided by a positive integer k, they leave the same remainder. What is the greatest possible value of k?
11. The four sides of quadrilateral ABCD are extended as shown below forming quadrilateral A'B'C'D'.  $AB = BA'$ ,  $BC = CB'$ ,  $CD = DC'$ ,  $DA = AD'$ . If the area of the quadrilateral ABCD is  $1\text{cm}^2$ , find the area of the quadrilateral A'B'C'D'.



12. A teacher whispers a positive integer  $p$  to student A,  $q$  to student B and  $r$  to student C. The students don't know one another's number, but they know the sum of the numbers is 14. The following is the sequence of their statements.

A says "I know that B and C have different numbers."

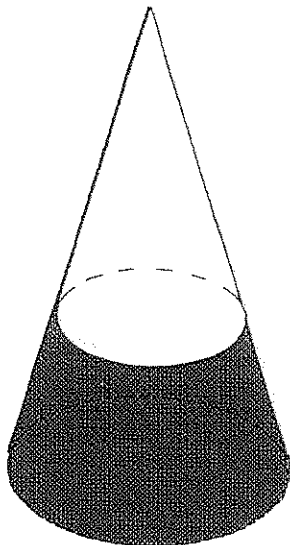
B says "I already knew that all three of our numbers were different."

C says "Now I know all three of our numbers."

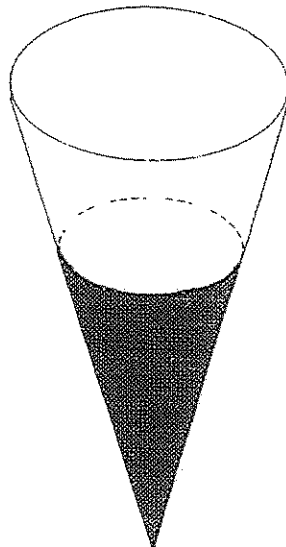
What is the product of  $p, q, r$  ?

13. Two identical cones A and B contain water. The water levels of A and B are half the height of the cones. The radius of the cone formed at the water level is half the radius of the base of the cone. Find the ratio of the volume of water in cone A to water in cone B.

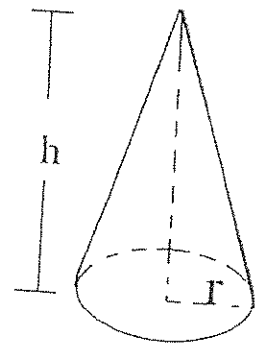
( Volume for cone =  $\frac{1}{3} \pi r^2 h$ ,  $r$  = radius of cone,  $h$  = height of cone )



Cone A



Cone B



14. Below is a diagram of a hotel key. In each square, either a hole is punched (●) or it is not punched (○). How many different keys can be produced by using such a method? (At least one hole is punched.)

Hotel  This side up	○	○	●	○
	●	○	○	○
	○	●	●	●

( This is an example of one possibility )

15. A six digit integer  $1\square\square\square\square\square$  has 1 as its first digit . If the first digit is transferred to the end of the number , it becomes  $\square\square\square\square\square 1$ . It is found that  $\square\square\square\square\square 1 = 3 \times 1\square\square\square\square\square$ . Find the original number  $1\square\square\square\square\square$ .



Po Leung Kuk  
5<sup>th</sup> Primary Mathematics World Contest  
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Answer Sheet

Name: \_\_\_\_\_

City: \_\_\_\_\_

1. \_\_\_\_\_

11. \_\_\_\_\_

2. \_\_\_\_\_

12. \_\_\_\_\_

3. \_\_\_\_\_  $\text{cm}^2$

13. \_\_\_\_\_ :

4. \_\_\_\_\_ :

14. \_\_\_\_\_

5. \_\_\_\_\_

15. 1

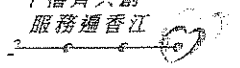
6. \_\_\_\_\_ units

7. \_\_\_\_\_

8. \_\_\_\_\_

9. \_\_\_\_\_  $\text{cm}^2$

10. \_\_\_\_\_



# PO LEUNG KUK Mathematics Competition 2001

## INDIVIDUAL ITEMS

Questions	Answer	Remark
1	85	
2	16	
3	$1/4$	
4	2:1 or 1:2	
5	61	
6	11	
7	167	
8	96	
9	8	
10	16	
11	5	
12	42	
13	7:1	
14	$2^{12}-1$	
15	1 4 2 8 5 7	