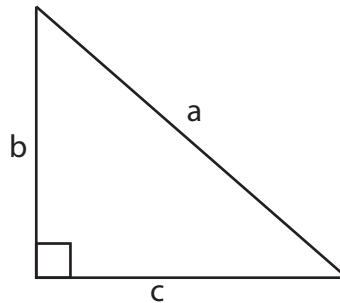# Po Leung Kuk 8ᵗʰ Primary Mathematics World Contest

Individual Contest.

Note: You may nees to use Pythagoras Theorem which states that

In a right-angled triangle, $a^2 = b^2 + c^2$, where a is the length of the longest side, and b and c are the lengths of the other two sides.


I1. Let y = 1 x 2 x 3 x ... x 20. What is the sum of the last 5 digisits of y?

I2. In the following figure, AC is a diameter of a circle with center O. ΔACB is an isosceles triange with <C = 90°. D is a point on AB. Arc CD is part of a circle with center B. If AC = 10cm, find the area of the shaded part. (Use π =3)
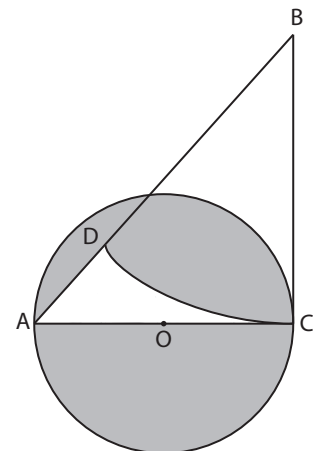
I3. Four Different digits form some four-digit numbers. If the sum of the greatest and the smallest is 11359, what is the smallest four-digit number?

I4.
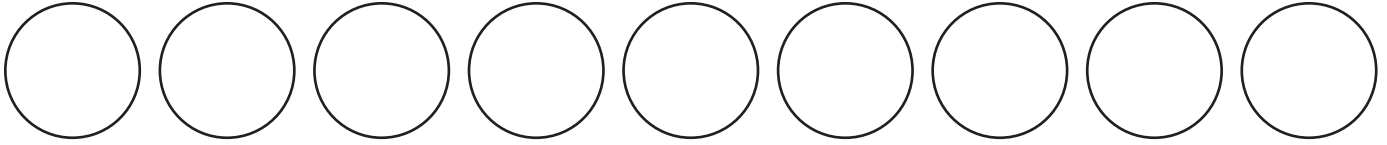
Arange the digits 1-9, without repeating, in the above sircles in such a way that:

    All the digits between 1 and 2 add up to 6

    All the digits between 2 and 3 add up to 14.

    All the sigits between 3 and 4 add up to 38.

   All the digits between 4 and 5 add up to 9.

    Find the smallest value of this 9-digit number

I5. A train travels from town A to town B. If this train increases its speed by 15 km/h (kilometers per hour), it will arrive in town B 48 minutes earlier. But if this train decreases its speed by 10 km/h, it will arrive in town 48 minutes later. What is the distance between town A and B?

I 6. Five boxes have different weights, each less tht 100 kilograms. The boxes are weighed in paris fro all possible combinations. (that means each box is weighed with every other box) The weights of all porrible paires are 113, 116, 110, 117, 112, 118, 114, 121, 120, 115. What is the wiehgt of the heaviest box?

I7. A positive number when divided by 6, 7, 0r 8 each leves a remainder of 1. It is divisible by 5. Find the smallest possible value for this number.

I8. In the following figure, ABC is a right-angled triangle. Semi cricles are drawn on the sides of the riangle. Find the total area of the threee semi circles if AC = 13. (Use $\pi = 3$)
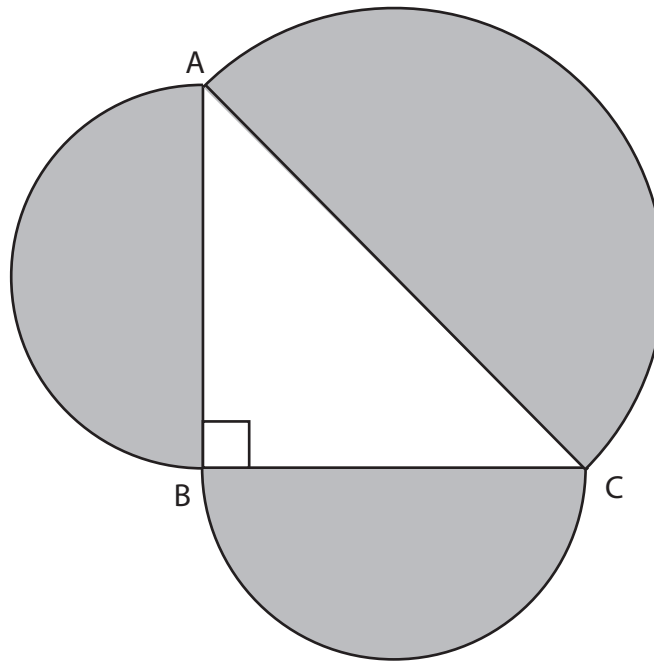
I9. If 2004 is dividied by a two-digit number, the remainder is 9. How many such two-digit numbers are there?

I10. The edge of a cube is 8 cm. all the faces are painted orange, It is tehn cut into small cubes of edge 1 cm. How many small cubes have exactly two faces painted?

I11. Today, 18 July 2004, is Sunday. Which day of the week was 1st January 1999?

I12. When a certain two digit number, AB is added to another two-dgit number, BA, the sum is a perfect square. Find the sum of all such possible two digit numbers.

I13. By using integers 1, 2, 3, 4, 5, 6 and 7 without repetition, how many even numbers less that 6000 can be formed?

I14. Given that $1^2 + 2^2 + ... + n^2 = \dfrac{n(n + 1)(2n + 1)}{6}$

Find the value of $1^2 + 3^2 + 5^2 + 7^2 + 9^2 + 11^2 + 13^2 + ... + 99^2$.

I15. A tank in the shape of a cube of edge 10m (meter) contians water. If it is turned to a position with an edges lying on the horizonatl surface with two faces inclined at 45° to the horizontal surface, the water will be up to the level indicated by A. The figure shows the front view of the tank. If it need an additional of 125 m³ of water to completely fill up the tank, find the length of AB.

A

B

45°   45°