Po Leung Kuk

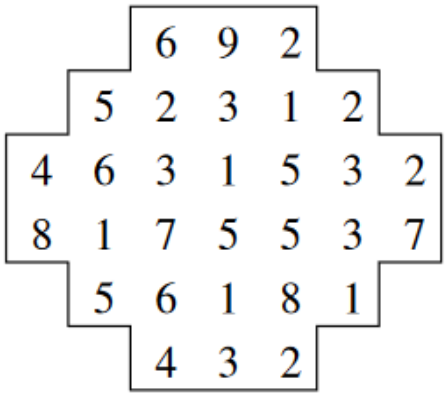
22nd Primary Mathematics World Contest

Team Contest 2019 – Shortlisted Questions

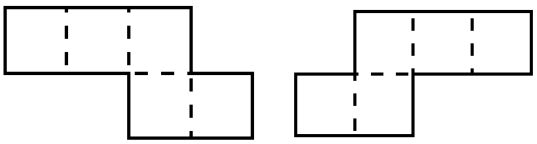
Team Contest

Question 1

Partition of the figure A into pieces such that each individual piece is either in the form of B or C (or their permutation) and the sum of the digits in each piece is 20.



A



B C

Question 2

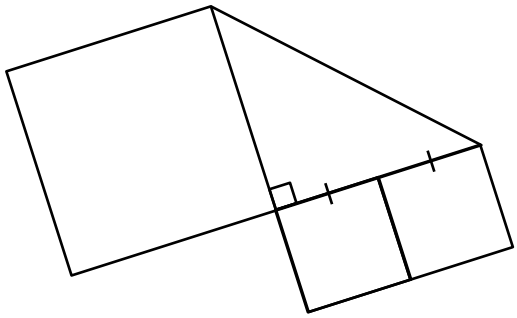
In the following equation, A, B, C and D each represent a different digit.

$$(\overline{ABC})^2 = \overline{CBCDBC}$$

What four-digit number is represented by $\overline{ABCD}$?

Question 3

The figure below is formed by three squares and a right-angled triangle. The total area of the three squares is 193 cm^2. The lengths of each side of the squares are all positive integers. What is the area, in cm^2, of the triangle?



Question 4

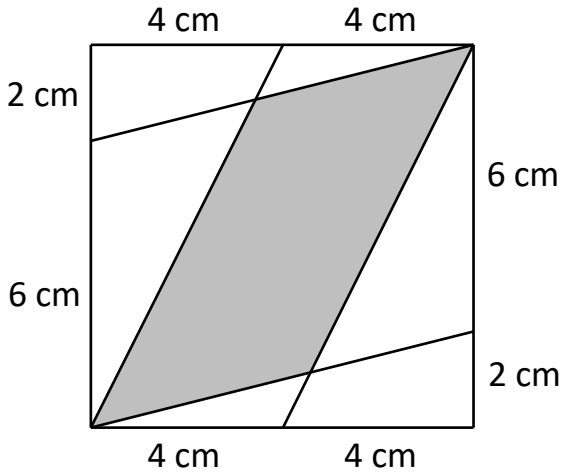
There are 2 digital clocks A and B. Clock A is losing 2 minutes per 24 hours and clock B is gaining 3 minutes per 24 hours. If both clocks are set at the correct time at 14:00 on 17/07/2019, on which date will both the clocks show the correct time again? The answer should be written in the format dd/mm/yyyy.

Question 5

The digits 2, 0, 1 and 9 are used exactly once each to form a four-digit number. This number is then divided by 7 and 11 respectively and the remainders are added together. What is the largest possible sum of these remainders?

Question 6

In the square below, find the area, in cm^2, of the shaded region.

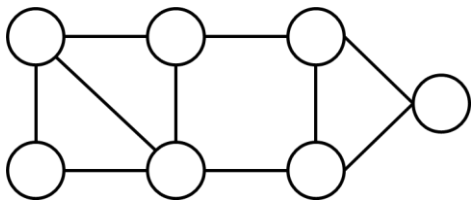


Question 7

The last two digits of the numbers 2019^m and 2019^n are the same. If m and n are positive integers where $m > n$, then what is the smallest possible value of $m - n$?

Question 8

In the figure below, circles connected by a line segment cannot be the same colour. In how many ways can the circles be coloured using a maximum of four colours?



Question 9

In the following equation, *A* to *J* each represents a different digit.

$$\overline{FBGA} + \overline{EHI} + \overline{IJA} = \overline{ABCDE}$$

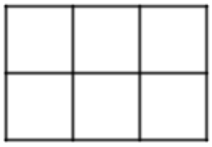
$$\begin{array}{cccccc} & F & B & G & A \\ & & E & H & I \\ + & & I & J & A \\ \hline A & B & C & D & E \end{array}$$

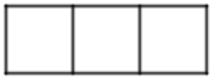
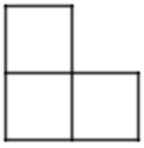
What is the value of the five-digit number represented by $\overline{ABCDE}$?

(*A*, *E*, *F* and *I* cannot be zero)

Question 10

Use each of the digits 1, 2, 3, 4, 5, 6 exactly once to fill the 2×3 table below (each 1×1 cell contains exactly one digit) such that there are no three odd digits or three even digits in three adjacent cells. How many ways are there to complete the table?



(note that, three adjacent cells make a  shape or a  shape or their permutations)