



Monday cup #21- Solution

Posted on: August, 19,2019

Due on: August, 25, 2019



Problem

Question: A 6-digit perfect square is coded as $XXYZXY$, with each letter stands for a digit. This can be sliced into two parts XXY and ZXY , which are themselves perfect squares. The numbers, represented by XY and XYZ are also perfect squares. What are X, Y and Z ?

Solution to Problem:

First, let's find what XY is. That's the easiest because it can have only 6 possibilities.

List all the 2 digit squares

16, 25, 36, 49, 64, 81

Now you need to find XXY .

116, 225, 336, 449, 664, 881

Out of these only 225 is a perfect square.

So you know that $X=2, Y=5$

Now to find CAB that's a perfect square

C cannot be 2 because $A=2$

Hence out of 125, 325, 425, 525, 625, 725, 825 and 925 only 625 is a perfect square.

And to check XYZ which is 256; 256 is also a perfect square!

So your number $XXYZXY$ is 225625 which is a perfect square.

So $X=2, Y=5, Z=6$

There were correct solutions from Nika Darsalia (Georgia, the country).

The prize was split between Darsalia

Rules

1. Anyone is eligible to participate. Each solution is to be the work of one individual without any input from faculty or others. An answer must be accompanied by appropriate justifications to be considered correct.
2. The solution is to be submitted with the solver's name, email, year in school (if applicable), local phone number, and local address. If you are submitting this for possible credit in a class, include your class number and instructors name.
3. The solution is to be typed or legibly written. Solutions must be submitted to the by 2 p.m. on the due date.
4. Entries will be graded on clarity of exposition and elegance of solution. An award of **GEL10** will be given for the best correct solution. In the case of a two-way tie, the award will be split. If there are more than two best solutions, a drawing will be held to determine two award winners.
5. Graduate students, faculty, and members of the general public are encouraged to submit solutions, but they will not be considered.

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Solution for this problem can be submitted proveweek@gmail.com