



Students of 7th class of primary school solve questions 1 to 3; students of 2nd and 3rd class of middle school from 1 to 5

- C1.** Given that \overline{pq} is a two digit integer where p is a tens digit and q is units digit. For what digits $a, b, c > 0$ are the values of the following quotients $\overline{ab} \div \overline{ba}$ and $\overline{bc} \div \overline{cb}$ equal and at the same time different from 1?
- C2.** In the same game, two players alternately write down the consecutive digits of an 18-digits number. If the final number is divisible by 9 then the winner is the person who started the game, otherwise the second player wins. They have to follow the following rules: 1) The first digit cannot be zero; 2) After any digit which is different than 9 they can only write a greater digit; 3) After digit 9 they can write any digit. Who has the winning strategy? What is that strategy?
- C3.** $ABCDEF$ is a regular hexagon. On the line segment DE , there is point P such that AD , CE and BP intersect at one point. Which line segment is longer? DP or EP ?
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- C4.** Find all triples of natural numbers (a, b, c) such that a, b and c are the lengths of a right-angled triangle with area $a + b + c$ and they satisfy $a < b < c$ inequalities.
- C5.** An $n \times n$ square was built from 2×1 domino tiles. Then, successively tiles adjacent to at least three other tiles (not yet removed), were removed. The operation was repeated as long as it was possible. Prove that in the end there was at least $\frac{2}{3}n$ tiles left.
(Attention: Tiles are neighbours if they have at least one unit of a common side).
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Solutions of the above tasks should be sent by a registered mail to the address:

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by

31st of March 2018

(date as postmarked).

All solutions must be written down on separate one sided A4 sheets. The solutions may be submitted in Polish or English language. In the left, top corner of each sheet, the participant writes his/her first and second name and the school and class name. It would be good to add an e-mail address. Before submitting the solutions, please read terms and conditions of the WLMJ. With solutions please send your parents/guardian consent. It may be downloaded from the website. Before submitting the solution, please fill the form on our website.

All information (in polish language) about Greater Poland's Mathematical League for Juniors (WLMJ), including tasks and current ranking of participants may be found on:

<http://wlmj.wmi.amu.edu.pl>
