

Kosovo National Mathematical Olympiad 2014

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– Grade 9

1 Prove that for any integer the number $2n^3 + 3n^2 + 7n$ is divisible by 6.

2 Solve $|x - 1| - 2|x + 5| > 3 + x$.

3 A student read the book with 480 pages two times. If he in the second time for every day read 16 pages more than in the first time and he finished it 5 days earlier than in the first time. For how many days did he read the book in the first time?

4 The number 2015 has been written in the table. Two friends play this game: In the table they write the difference of the number in the table and one of its factors. The game is lost by the one who reaches 0. Which of the two can secure victory?

5 A square $ABCD$ with side length 1 is given and a circle with diameter AD . Find the radius of the circumcircle of this figure.

– Grade 10

1 Let a and b be the solutions to $x^2 - x + q = 0$, find $a^3 + b^3 + 3(a^3b + ab^3) + 6(a^3b^2 + a^2b^3)$.
