Online Number Theory Seminar

14 June 2024. – 17:00-17:50

T. Miyazaki: Number of solutions to a special type of unit equations in two unknowns III

This talk is a continuation of the one presented by the speaker on November 25, 2022. It is conjectured that for any fixed relatively prime positive integers a, b and c all greater than 1 there is at most one solution to the equation $a^x + b^y = c^z$ in positive integers x, y and z, except for specific cases. In this talk we give a brief introduction to the conjecture highlighting the contents of Part II, and present our results with their proofs. In particular we find some, presumably infinitely many, new values of c with the property that for each such c the conjecture holds true, except for only finitely many pairs of a and b. Most importantly we prove that if $c = 13$ then the equation has at most one solution, except for $(a, b) = (3, 10)$ or $(10, 3)$ each of which gives exactly two solutions. This is a joint work with I. Pink.