Abstract

We will review briefly the general theorems on rational and integral points on elliptic curves(essentially Mordell-Weil Theorem and Siegel's Theorem).

Then we will concentrate on a very concrete problem (in the style of old number theorists): Which numbers can be written simultaneously as a product of two consecutive integers and the product of three consecutive numbers in arithmetic progression with common difference a?

This problem was solved for a=1 by Mordell (1963) for a=2 and 5 by Godinho-Porto-Togbé (2014) and further 20 values by Lee-Louboutin (2017). While these authors used factorisation in cubic fields, we make full use of the Diophantine theory of elliptic curve to reprove these results and go much further.

The talk is naturally aimed at a wide audience of mathematicians.

The latter part is joint work with Godinho and Marques (University of Brasilia, Brazil).