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Jinbo Ren*, 141 Cabell Dr, Kerchof Hall, Charlottesville, VA 22903. *Mathematical logic and its applications in number theory.*

A large family of classical problems in number theory such as:

(a) Finding rational solutions of the so-called trigonometric Diophantine equation $F(\cos 2\pi x_i, \sin 2\pi x_i) = 0$, where F is an irreducible multivariate polynomial with rational coefficients;

(b) Determining all $\lambda \in \mathbb{C}$ such that $(2, \sqrt{2(2-\lambda)})$ and $(3, \sqrt{6(3-\lambda)})$ are both torsion points of the elliptic curve $y^2 = x(x-1)(x-\lambda)$;

can be regarded as special cases of the Zilber-Pink conjecture in Diophantine geometry. In this short talk, I will explain how we use tools from mathematical logic to attack this conjecture. In particular, I will present a series partial results toward the Zilber-Pink conjecture, including those proved by Christopher Daw and myself. (Received January 19, 2020)