九大代数学セミナー

※「通常と曜日が異なります」

日時 2023 年 10 月 17 日 (火) 16:00-17:00

場所 九州大学伊都キャンパス ウエスト 1 号館 5 階 C-513 中講義室,
および Zoom ミーティングによるオンライン開催

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講演者 Jerome T. Dimabayao (University of the Philippines Diliman)

題目 **An irrational variant of the congruent number problem**

概要 A positive integer n is called a θ-congruent number if there is triangle with rational sides a, b and c for which the angle between a and b is equal to θ and its area is $n\sqrt{r^2 - s^2}$, where $0 < \theta < \pi$, $\cos\theta = s/r$ and $0 \leq |s| < r$ are relatively prime integers. The notion of θ-congruent numbers is a natural generalization of the classical congruent numbers, which correspond to the case where $\theta = \pi/2$. It is known that the problem of classifying θ-congruent numbers is related to the problem of finding non-trivial rational points on certain families of elliptic curves.

In this talk, we present a certain variant of the congruent number problem. More explicitly, we discuss integers which occur as areas of triangles with two rational sides and arbitrary fixed angle ψ with one adjacent side a rational multiple of a quadratic surd. We call such numbers ψ-congruent. We present a criterion that involves elliptic curves for deciding whether a given positive integer is ψ-congruent. We also discuss some results about $\pi/4$-congruent numbers from a joint work with Soma Purkait.

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