

המחלקה למתמטיקה, בן-גוריון

קולוקוויום

ביום שלישי, 17 במאי, 2022

בשעה 14:30 – 15:30

ב-101 Math

ההרצאה

(1959) Problem Circle Ringel's to Solution A

תינתן על-ידי

(BGU) Smorodinsky Shakhar

תקציר: In 1959 Gerhard Ringel posed the following problem which remained open for 60 years. Suppose we are given a finite family of circles in the plane, no two of which are tangent internally, and no three of which are tangent pairwise at the same point. Is it possible to color the circles with five colors so that circles of the same color are pairwise disjoint (i.e., do not overlap)? When the circles are bounded discs, the answer is yes (this is the Four-Color-Theorem for planar graphs). When the circles are open discs, the answer is no (this is Ringel's conjecture).

We construct a family of circles in the plane such that no two are tangent internally, and no three are tangent pairwise at the same point, and such that the chromatic number of the tangency graph is arbitrarily large. This provides a counterexample to Ringel's conjecture. The proof relies on a multidimensional analog of the Four-Color-Theorem.

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Ramsey-Theory. from tools
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