Problem ♡–7

Due in DSC 235 by 12 noon, Friday, October 27, 2017

Problem A: *Can you divide the three dimensional Euclidean space* $\mathbb{R}^3$ *into 2017 congruent disjoint pieces ?*
(We say that sets $A, B \subseteq \mathbb{R}^3$ are congruent if A is the image of B under some translation.)

Problem B: *Does there exist a subset* X *of the plane with the property that the orthogonal projection of* X *onto any line is the union of two disjoint open line segments ?*

Rules:

- The competition is open to all *undergraduate* UNO students.
- Please submit your solutions to Andrzej Roslanowski in DSC 235 or to his mailbox. (Needless to say, they should be be written clearly and legibly.)
- The winners will be determined each semester based on the number of correct solutions submitted.
- Problems will be posted by Friday 5pm and the solutions are due by the following Friday 12 noon.

Prizes:

- Winners will received books published by the American Mathematical Society. The titles actually awarded will be selected in cooperation with the awardees.
- In Summer 2018, there is a research opportunity possibly that could lead to an Erdős Number (3 or possibly 2). Strong performance in POW is one of the crucial prerequisites.