Problemen

| Problem Section

Problem A (proposed by Hendrik Lenstra)

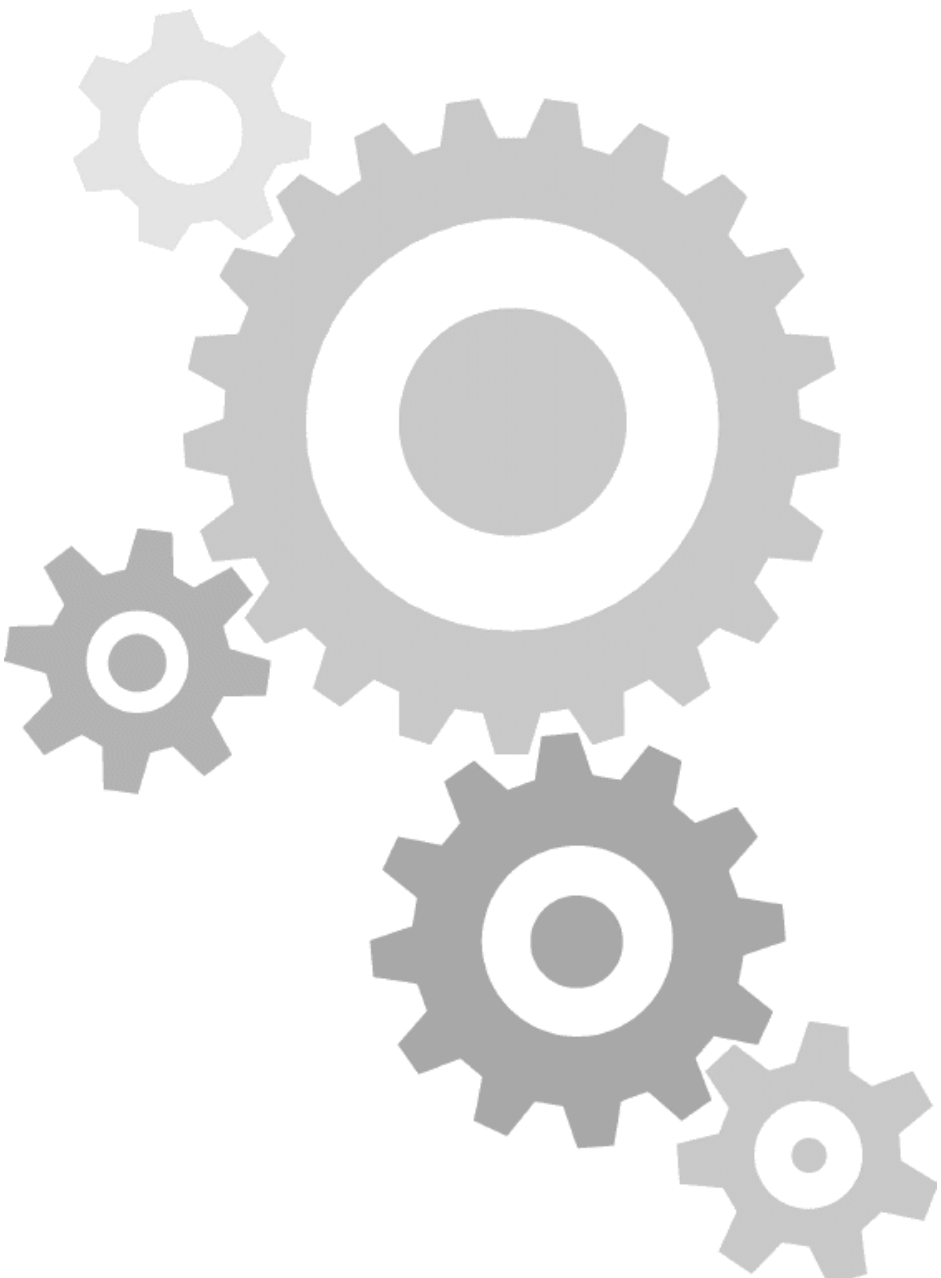
Let m and n be coprime positive integers. Let Γ be the graph that has the disjoint union $\mathbb{Z}/n\mathbb{Z} \sqcup \mathbb{Z}/m\mathbb{Z}$ as vertex set and that has for every $1 \leq i \leq m+n-1$ an edge connecting $i \bmod n$ and $i \bmod m$. Show that Γ is a tree.

Problem B (proposed by Gabriele Dalla Torre)

Is it possible to partition a non-empty open interval in closed intervals of positive length? Let Δ be a triangle (including its interior) and let $P \in \Delta$ be an interior point. Is it possible to partition $\Delta - \{P\}$ in closed line segments of positive length?

Problem C (proposed by Tejaswi Navilarekallu)

A move on a pair (a, b) of integers consists of replacing it with either $(a+b, b)$ or $(a, a+b)$. Show that starting from any pair of coprime positive integers one can obtain a pair of squares in finitely many moves.



Redactie:
Johan Bosman
Gabriele Dalla Torre
Jinbi Jin
Ronald van Luijk
Lenny Taelman
Wouter Zomervrucht

Problemenrubriek NAW
Mathematisch Instituut
Universiteit Leiden
Postbus 9512
2300 RA Leiden
problems@nieuwarchief.nl
www.nieuwarchief.nl/problems