ICM 1998, Berlin, Aug. 18–27

Abstracts of Short Communications and Posters

Section:

13. Combinatorics

1991 MS Classification: 05, 06

Smoluk, Antoni, Wroclaw University of Economics, Poland

Fix-point property of finite partially ordered sets

Partially ordered set (poset) X has fixed point property if for every increasing function $f : X \to X$ there is a fix-point. Rival has stated the following problem: *Characterize the finite ordered sets with fixed point property.* Increasing function f is called invariant if X and image $f(X)$ simultaneously have or have not fixed point property. Such image will be also called invariant. All invariant images are ordered by relation of imbedding (isomorphic sets are identified). Let $C_0 = \{1\}$ and p, q are different prime numbers; a crown

$$C_{k+1} = \{p, p^2q, \ldots, p^{k+1}q^k, q, q^2p, \ldots, q^{k+1}p^k\}$$

is $2(k+1)$-point set of natural numbers ordered by relation of divisibility. Only set C_0 has the fixed point property. Main result: Poset X has fixed point property if, and only if its minimal invariant image is C_0. Minimal invariant image is alw ays unique and a crown.

Reference: I. Rival, Unsolved Problems, *Order* 1(1984), 103-105.