



## CONJUGACY OF P-CONFIGURATIONS AND NONLINEAR SOLUTIONS TO A CERTAIN CONDITIONAL CAUCHY EQUATION

ORR MOSHE SHALIT<sup>1</sup>

Communicated by T. Riedel

ABSTRACT. We study the connection between conjugations of a special kind of dynamical systems, called *P-configurations*, and solutions to homogeneous Cauchy type functional equations. We find that any two *regular* *P*-configurations are conjugate by a homeomorphism, but cannot be conjugate by a diffeomorphism. This leads us to the following conclusion (answering an open question posed by Paneah): *there exist continuous nonlinear solutions to the functional equation:*

$$f(t) = f\left(\frac{t+1}{2}\right) + f\left(\frac{t-1}{2}\right), \quad t \in [-1, 1].$$

<sup>1</sup> DEPARTMENT OF MATHEMATICS, TECHNION - ISRAEL INSTITUTE OF TECHNOLOGY, HAIFA 32000, ISRAEL.

*E-mail address:* [orrms@tx.technion.ac.il](mailto:orrms@tx.technion.ac.il)

*Date:* Received: 30 April 2008; Accepted 7 July 2008.

*2000 Mathematics Subject Classification.* Primary 39B22; Secondary 37B99.

*Key words and phrases.* Conditional functional equation, Cauchy type functional equation, *P*-configuration, guided dynamical system.