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J. Differential Equations 259 (2015) 7135–7160

Journal of Differential Equations

www.elsevier.com/locate/jde

Limit cycles bifurcating from planar polynomial quasi-homogeneous centers

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Received 20 January 2014; revised 12 August 2015

Available online 28 August 2015

Abstract

In this paper we find an upper bound for the maximum number of limit cycles bifurcating from the periodic orbits of any planar polynomial quasi-homogeneous center, which can be obtained using first order averaging method. This result improves the upper bounds given in [7].

MSC: 34C05; 34A34; 34C20

Keywords: Quasi-homogeneous polynomial differential equations; Bifurcation of limit cycles; Quasi-homogeneous centers

1. Introduction

In this work we deal with polynomial differential systems of the form

$$\dot{x} = P(x, y), \quad \dot{y} = Q(x, y), \tag{1}$$

where $P(x, y), Q(x, y) \in \mathbb{R}[x, y]$. The dot denotes derivative with respect to an independent real variable t. We say that the degree of the system is $n = \max\{\deg P, \deg Q\}$.

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http://dx.doi.org/10.1016/j.jde.2015.08.014
0022-0396/