



Centers of planar generalized Abel equations

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Abstract

We deal with the differential equation

$$\dot{r} = \frac{dr}{d\theta} = a(\theta)r^n + b(\theta)r^m,$$

where (r, θ) are the polar coordinates in the plane \mathbb{R}^2 , m and n are integers such that $m > n \geq 2$, and a, b are C^1 functions. Note that when $n = 2$ and $m = 3$ we have an Abel differential equation. For this class of generalized Abel equations we characterize a new family of centers.

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1. Introduction and statement of the results

Consider the generalized Abel equation

$$\dot{r} = \frac{dr}{d\theta} = a(\theta)r^n + b(\theta)r^m, \tag{1}$$

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