

Limit Cycles of Polynomial Systems with Homogeneous Non-linearities

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We study the class of vector fields of the form $\dot{x} = P_1(x, y) + P_n(x, y)$, $\dot{y} = Q_1(x, y) + Q_n(x, y)$, where P_k and Q_k are real homogeneous polynomials of degree k , $n \geq 2$, and the origin is a non-degenerate critical point of index 1. For this class of vector fields we give four theorems about their limit cycles. © 1989 Academic Press, Inc.

1. INTRODUCTION AND STATEMENT OF THE MAIN RESULTS

We consider two-dimensional autonomous systems of differential equations of the form

$$\begin{aligned}\dot{x} &= P_1(x, y) + P_n(x, y), \\ \dot{y} &= Q_1(x, y) + Q_n(x, y),\end{aligned}\tag{1.1}$$

where P_k and Q_k are real homogeneous polynomials of degree k , $n \geq 2$, and the origin is a non-degenerate critical point of index 1.

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