

Cyclicity versus Center Problem

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Abstract We prove that there are one-parameter families of planar differential equations for which the center problem has a trivial solution and on the other hand the cyclicity of the weak focus is arbitrarily high. We illustrate this phenomenon in several examples for which this cyclicity is computed.

Keywords Polynomial differential system · Focal quantities · Lyapunov constants · Cyclicity · Limit cycles

Mathematics Subject Classification (2000) Primary 34C07;
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1 Introduction and Main Results

Three of the main problems in the qualitative theory of planar polynomial differential systems are: the determination of the number of limit cycles and their distribution in

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