On the limit cycles of linear differential systems with homogeneous nonlinearities
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Abstract. We consider the class of polynomial differential systems of the form \( \dot{x} = \lambda x - y + P_n(x, y) \), \( \dot{y} = x + \lambda y + Q_n(x, y) \), where \( P_n \) and \( Q_n \) are homogeneous polynomials of degree \( n \). For this class of differential systems we summarize the known results for the existence of limit cycles, and we provide new results for their nonexistence and existence.