

**Gundersen, Gary G.**

**On the question of whether  $f'' + e^{-z}f' + B(z)f = 0$  can admit a solution  $f \neq 0$  of finite order.**

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The author proves the following results in this paper. Theorem 1. If  $B(z)$  is a transcendental entire function with order  $(B) \neq 1$ , then every solution  $f \neq 0$  to the DE  $f'' + e^{-z}f' + B(z)f = 0$  has infinite order. For the differential equation (1)  $f'' + e^{-z}f' + Q(z)f = 0$  where  $Q(z)$  is a polynomial, the following theorems are proved: Theorem 2. If  $Q(z)$  is a polynomial of odd degree, then every solution  $f \neq 0$  to equation (1) has infinite order. Theorem 3. Let  $Q(z) = q_n z^n + \dots + q_0$  be a polynomial of even degree  $n \geq 2$ . If either (i)  $n = 2 + 4k$  ( $k = 0, 1, 2, \dots$ ) and  $q_n$  is not a positive real number, or (ii)  $n = 4k$  ( $k = 1, 2, 3, \dots$ ) and  $q_n$  is not a negative real number, then every solution  $f \neq 0$  to equation (1) has infinite order.

Reviewer: [P.N.Bajaj](#)

**MSC:**

[34M99](#) Ordinary differential equations in the complex domain

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second order differential equation; transcendental entire function; infinite order

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**References:**

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