

**MR628113 (82j:35028) 35E99**

**Yoshino, Masafumi**

**On the solvability of Goursat problems and a function of number theory.**

*Proc. Japan Acad. Ser. A Math. Sci.* **57** (1981), no. 6, 294–296.

The following reduced Goursat problem with constant coefficients is studied:

$$(a\partial_1^{-1}\partial_2 + \varepsilon + b\partial_1\partial_2^{-1} + c\partial_1^2\partial_2^{-2})u = h(x)$$

where  $x = (x_1, x_2) \in \mathbf{C}^2$ ,  $\partial_i = \partial/\partial x_i$  ( $i = 1, 2$ ) and  $\partial_i^{-1}$  denotes integration with respect to the variable  $x_i$  from the origin to  $x_i$ . The characteristic roots are the roots of the equation  $a\lambda^3 + \varepsilon\lambda^2 + b\lambda + c = 0$ . Solvability and uniqueness theorems are stated, using several nontrivial arithmetical properties of the characteristic roots; one of them introduces a new function of number theory. Those theorems supplement preceding results by the reviewer [*J. Math. Pures Appl.* (9) **53** (1974), 133–136; [MR0367411 \(51 #3653\)](#)], the reviewer and C. Pisot [*ibid.* (9) **53** (1974), 137–145; [MR0366856 \(51 #3102\)](#)], and S. Alinhac [*Comm. Partial Differential Equations* **1** (1976), no. 3, 231–282; [MR0415082 \(54 #3173\)](#)].

Reviewed by *Jean Leray*

© Copyright American Mathematical Society 1982, 2006