where

$$f_j(t) = \begin{cases} 2^{s-1}\Gamma(s) J_{s-1}(t)/t^{s-1} & \text{for real } |\cdot|_j \\ 2^{2s-1}\Gamma(2s) J_{2s-1}(\sqrt{t})/t^{\frac{2s-1}{2}} & \text{for complex } |\cdot|_j . \end{cases}$$

Here $J_s(t)$ denotes the J-Bessel function of order s. Then $(1+\Theta_1)\delta$ is still increasing in each argument, as can be proved by Poisson summation. The integral of $\Theta_1 \delta^u$, taken over G/V for any $1 < u < s + \frac{1}{2}$, equals $Z_1(u)$ where $Z_1(u)$ is defined as $Z(u)$ but with $\gamma(u)$ replaced by

$$\gamma_1(u) = \left(2^{u-1}\Gamma(s)\Gamma\left(\frac{u}{2}\right) / \Gamma\left(\frac{2s-u}{2}\right)\right)^{r_1} \left(2^{2u}\Gamma(2s)\Gamma(u)/\Gamma(2s-u)\right)^{r_2}.$$

The same reasoning as above will lead then to a lower bound for R/w as in the theorem, but with γ replaced by γ_1.

The inequality (1) remains true if one replaces $Z(s)$ by the product of any partial Dedekind zeta function of K and $\gamma(s)$. It also remains true if $Z(s)$ is replaced by the (proper) Dedekind zeta function and R/w is multiplied by the class number of K. As was pointed out by W. Kohnen it might be interesting to study these inequalities for special classes of fields like, for instance, abelian fields, where the Dedekind zeta function is of a rather simple shape.

REFERENCES

[F-S] FRIEDMAN, E. and N.-P. SKORUPPA. Lower bounds for the L^p-norm in terms of the Mellin transform. To appear in *Bull. London Math. Soc.* (1993).

[H] HECKE, E. Über die Zetafunktion beliebiger algebraischer Zahlkörper. *Mathematische Werke,* Vandenhoeck & Ruprecht, Göttingen, 1959, pp. 159-171.

[Z] ZIMMERT, R. Ideale kleiner Norm in Idealklassen und eine Regulatorabschätzung. *Invent. Math. 62* (1981), 367-380.

(Reçu le 23 avril 1992)

Nils-Peter Skoruppa

Max-Planck-Institut für Mathematik
Gottfried-Claren-Strasse 26
D-W-5300 Bonn 3, FRG

E-mail address: nils@mpim-bonn.mpg.de