MATH 504 ANALYSIS IN EUCLIDEAN SPACES, SPRING TERM 2009, PROBLEMS 11

Return by Wednesday 15th April

1. In class we showed that if

$$f(x) = \int_{-b}^{b} \hat{f}(t) e(xt) dt = 0 \tag{1}$$

for $|x| > a$, then f is identicaly 0. Prove that the conclusion holds provided only that (1) holds when $x \in (a, a')$ where $a < a'$.

2. An entire function f is of exponential type $T < \infty$ when

$$\limsup_{R \to \infty} R^{-1} \log \max_{|z|=R} |f(z)| = T.$$

(i) Prove that $T < 0$ iff $f \equiv 0$.
(ii) Give examples of non-constant entire functions of type 0 and of type 1.