connecting the fixed points of T. (4) If O_1 and O_2 are disjoint simply connected domains invariant under a loxodromic T, the corresponding arcs, as in (3), divide S into two Jordan regions, one or the other of which must contain any domain disjoint from O_1 and O_2. (5) If O is a simply connected domain invariant under an elliptic T, then O must contain a fixed point of T.

The examples are elaborations of the ideas in L. R. Ford, *Automorphic functions*, 2nd ed., Chelsea, 1951, pp. 55–59.

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DIFFERENTIABLE NORMS IN BANACH SPACES[1]

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Communicated by W. Rudin, January 20, 1964

1. **Introduction.** In [4, p. 28] S. Lang has asked whether or not a separable Banach space has an admissible norm of class C^1. In this note we indicate a proof of the following theorem, which characterizes those Banach spaces for which such a norm exists.

THEOREM 1. *A separable Banach space has an admissible norm of class C^1 if and only if its dual is separable.*

It follows from this theorem that not even $C(I)$ possesses an admissible differentiable norm.

2. **Preliminaries.** Let X be a Banach space with norm α; we write $S_\alpha = \{x \mid \alpha(x) = 1\}$ and $B_\alpha = \{x \mid \alpha(x) \leqq 1\}$. A norm in X is admissible if it induces the same topology as does α. The dual space is written X^* and the norm dual to α is denoted by α^*. An $f \in X^*$ is called a support functional to B_α at $x \in S_\alpha$ if $\alpha^*(f) = f \cdot x$; if f has norm 1, it is called a normalized support functional and is written ν_x. A norm is smooth if there is a unique normalized support functional to B_α at each $x \in S_\alpha$. The norm α is differentiable at $x \neq 0$ if there is an $\alpha'(x) \in X^*$ such that

$$\lim_{y \to x; y \neq x} \frac{|\alpha(y) - \alpha(x) - \alpha'(x) \cdot (y - x)|}{\alpha(y - x)} = 0$$

[1] Research partially supported by NSF Grant G-24471.