

Math 582

Homework - Part 2

Due March 17

Problem 1. Let μ be a Radon measure on \mathbb{R}^n . Assume that for all $a \in \text{spt } \mu = \Sigma$

$$c = \limsup \frac{\mu(B(a, 2r))}{\mu(B(a, r))} < \infty.$$

Show that for μ a.e. $a \in \mathbb{R}^n$, if $\nu \in \text{Tan}(\mu, a)$ then ν is a doubling measure, i.e. for each compact set $K \subset \mathbb{R}^n$ there exists a constant $C_K > 0$ such that for $x \in \text{spt } \nu \cap K$, and $r > 0$

$$\nu(B(x, 2r)) \leq C_K \nu(B(x, r)).$$

Note: If the general case is too technically involved you may assume that

$$\sup_{a \in \Sigma} c(a) < \infty.$$