Math 205 HW5:

1. a. Show that if $0 < p < 1$ Then the reverse Hölder inequality holds.
b. Use the reverse Hölder to show that the reverse Minkoswski inequality holds.

2. Let μ be a finite Borel measure on $[0, \infty)$such that

- $\mu \ll \lambda$,and
- $\mu(B) = a\mu(aB)$ for each $a \geq 1$ and for each Borel set $B \in [0, \infty)$, where $aB = \{ab : b \in B\}$

If the Radon -Nikodym derivative $\frac{d\mu}{d\lambda}$ is a continuous function, show that there exists a constant $c \geq 0$ such that $\frac{d\mu}{d\lambda}(x) = \frac{c}{x^2}$ for each $x \geq 1$

3. Verify the following properties of signed measures
a. $\mu_1 \perp \mu_2$ then $|\mu_1| \perp |\mu_2|$
b. $\nu \ll \mu$ and $\mu \ll \omega$ then $\nu \ll \omega$
c.$0 \leq \nu \leq \mu$ then $\nu \ll \mu$
d. $\mu \ll 0$ then $\mu = 0$