Continuity of Measure- HW Problems

1. Define $E\Delta F = (E \sim F) \cup (F \sim E)$. Let $E = (0,1)$, $F = (-\frac{1}{2}, \frac{1}{2})$, and $G = (\frac{1}{4}, \frac{5}{4})$. Find $E\Delta F, F\Delta G$, and $E\Delta G$.

2. Suppose E, F, and G are measurable subsets of $[0,1]$ and $m(E\Delta F) = m(F\Delta G) = 0$. Prove that $m(E\Delta G) = 0$.

3. Show that the finite additivity of the Lebesgue measure with the continuity of measure implies countable additivity of the Lebesgue measure.