a.) Clearly every sequence $a_1 a_2 a_3 \ldots$ has probability

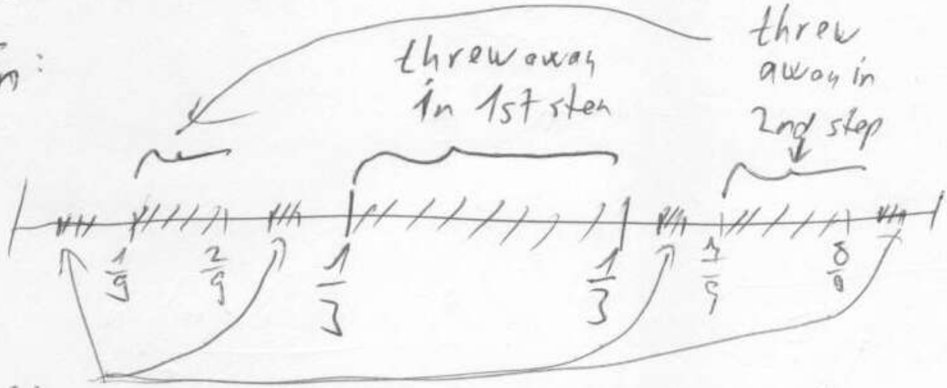
$\frac{1}{2} \cdot \frac{1}{2} \cdot \frac{1}{2} \cdot \ldots = 0$,   infinitely long!

and every $x \in \mathbb{R}$ has at most two ternary representations $\Longrightarrow \mathbb{P}(X = x) = 0$ for $\forall x \in \mathbb{R}$. $\square$

[Actually, the ternary representation with $a_n \in \{0, 2\}$ is unique for all $x \in C$.]

b.) Obviously, $\boxed{\mu(C) = 1}$.

On the other hand, $Leb(C) = 0$, because C is the intersection of a shrinking sequence of sets C_n:



threw away in 3rd step

so $C \subset C_n$ for all n,

but $Leb(C_n) = \left(\frac{2}{3}\right)^n$, so $Leb(C) \leq \left(\frac{2}{3}\right)^n$ for $\forall n$

$\Rightarrow \boxed{Leb(C) = 0}$ so $\mu \not\ll Leb$

$\square$