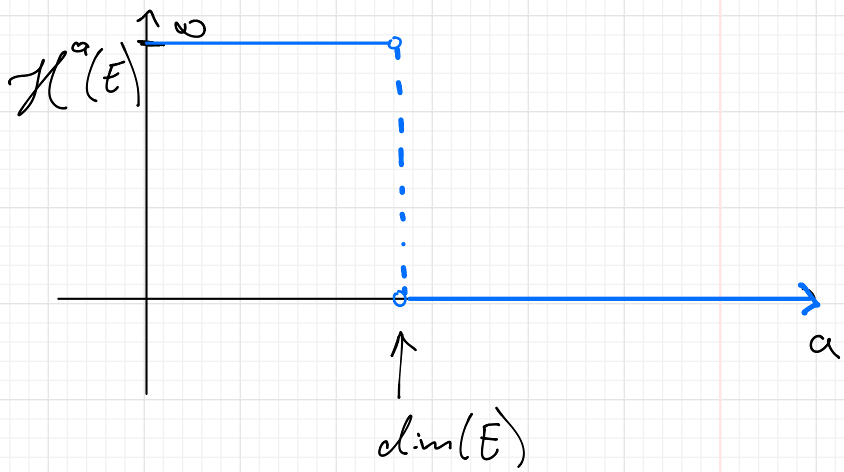
HW Suppose that $\mathcal{H}^s(E) = a$, $0 < a < \infty$.

- If $s' < s$, what is $\mathcal{H}^{s'}(E)$? $+\infty$
- If $s' > s$, what is $\mathcal{H}^{s'}(E)$? 0



HW Let $E = \{ \frac{1}{n} \mid n \in \mathbb{N} \}$. Compute $\mathcal{H}^s(E)$ for $s = 0, 1, \varepsilon > 0$

Prop If $\{E_i\}$ is a countable collection of sets, show that

$$\dim\left(\bigcup_i E_i\right) = \sup_i \dim(E_i).$$

Prop $E \subseteq F \implies \dim(E) \leq \dim(F)$.

$\mathcal{H}^s_\delta(\mathbb{Q})$ Let q_i be any enumeration of $\mathbb{Q}$

$$= \inf\left\{ \sum_{i=1}^{\infty} \alpha_s 2^{-s} \operatorname{diam}(E_i)^s \,\middle|\, \mathbb{Q} \subset \cup E_i \right\}$$

Set $E_i = B\left(q_i, \frac{\delta}{2^{i+1}}\right)$

$$\leq \inf\left\{ \sum_{i=1}^{\infty} \alpha_s 2^{-s} \left(\frac{\delta}{2^i}\right)^s \right\}$$

$s > 0$

$$= \alpha_s 2^{-s} \inf\left\{ \delta^s \sum_{i=1}^{\infty} \frac{1}{2^i} \right\}$$

$$= \alpha_s 2^{-s} \inf(\delta^s) = 0 \quad \text{for all } s > 0$$

$$= \infty \quad \text{for } s = 0$$

HW: Read §3.1 up to 3.1.3; try to understand the statement of Th 3.1.3. Prove it???