EXERCISES 3.4.5.

(1) Show that the set of essentially bounded measurable functions f on a set with a measure μ is a complex vector space, and that $\|cf\|_\infty = |c| \cdot \|f\|_\infty$ for $c \in \mathbb{C}$.

(2) Verify Hölder's inequality for the pair $p = \infty$ and $q = 1$ of conjugate exponents.

(3) Let μ be the counting measure on a countable set. Describe $L^p(\mu)$ for $p \in [1, \infty]$.