Problem 1 (11.10)**.** Prove Proposition 11.7 which is stated follows:

Proposition (11.7)**.** Let f be an nonnegative measurable function. Then there is a sequence $\{\phi_n\}$ of simple functions with $\phi_{n+1} \geq \phi_n$ such that $f = \lim_{n\to\infty} \phi_n$ at each point of X, If f is defined on a σ-finite measure space, then we may choose the functions ϕ_n so that each vanishes outside a set of finite measure.

Problem 2 (11.22)**.** (a) Let $(X, \mathcal{B}, \mu)$ be a measure space and g a nonnegative measurable function on X. Set $vE = \int fg \, \mathrm{d}\mu$. Show that v is a measure on $\mathcal{B}$.

(b) Let f be a nonnegative measurable function on X. Then

$$\int f \, \mathrm{d}v = \int fg \, \mathrm{d}\mu.$$