

**Problem**

Suppose that  $f_n$  and  $f$  are complex-valued measurable functions on a measurable  $E \subset \mathbb{R}^d$ , and  $\phi : \mathbb{C} \rightarrow \mathbb{C}$ .

- (a) Prove that if  $\phi$  is continuous and  $f_n \rightarrow f$  a.e, then  $\phi \circ f_n \rightarrow \phi \circ f$  a.e.
- (b) Prove that if  $\phi$  is uniformly continuous and  $f_n \rightarrow f$  almost uniformly, then  $\phi \circ f_n \rightarrow \phi \circ f$  almost uniformly.

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