

1. Let  $p \in [1, \infty]$  and let  $f \in L^p(E)$ .

a) Show that if  $m(E) < \infty$  then  $f \in L^q(E)$  for any  $q \leq p$ .

b) Show that if  $f \in L^\infty(E)$  then  $f \in L^q(E)$  for any  $q \geq p$ .

2. Suppose that  $f \in L^p(E)$  for every  $p \in [1, \infty)$ , where  $m(E) < \infty$ . Does it follow that  $f \in L^\infty(E)$ ?

Complete exercises 5.1 through.