1. Suggested Problems:
   
   (a) Chapter 3 (Page 61): 2, 4, 5, 6, 8, 10, 15, 16, 17, 18, 19, 22, 23

2. Problems to Submit:

   1) Suppose that $E$ is a metric space and $S \subset E$ is complete. Prove that $S$ is closed.

   2) Using the definition of “convergence of a sequence”, prove
      
      (a) \( \{a_n\} \) converges to $a$ implies $a_n^2$ converges to $a^2$.
      
      (b) \( \{a_n\} \) converges to $a$ implies $|a_n|$ converges to $|a|$.

   3) Verify that the following are metric spaces
      
      (a) all $n$-tuples of real numbers, with
      
      \[
d((x_1, \ldots, x_n), (y_1, \ldots, y_n)) = \sum_{i=1}^{n} |x_i - y_i|
\]

      (b) all bounded infinite sequences $x = (x_1, x_2, x_3, \ldots)$ of elements of $\mathbb{R}$, with
      
      \[
d(x, y) = \sup_i |x_i - y_i|
\]

   4) Prove that the sum of two Cauchy sequences is Cauchy.