Homework 2-Math 447

Due Date: Wednesday 7/2 in class

(1) Use the $\varepsilon$-$\delta$ criterion to prove continuity for
   (a) $f(x) = x$;
   (b) $f(x) = x^2$;
   (c) $f(x) = \frac{x^2}{1+x^2}$.

(2) Let $(s_n)$ be sequence in $[0, 1]$ such that for all $0 \leq k \leq 2^n$

   \[ k2^{-n} \in \lim((s_n)) \]

   Calculate the Limit set $\lim((s_n))$.

(3) (one week more) Construct a sequence such that

   \[ \lim((s_n)) = \{1 - \frac{1}{k} | k \in \mathbb{N}\} \]

(4) 10.10 page 65 (use Cauchy sequence are converging)

(5) 10.11 page 65 (use Cauchy sequence are converging)