Due: Wednesday, September 5

1. Exercise 1.1.D in the text.
2. Define a sequence (x_n) by $x_1 = 2$ and, for $n \geq 2$,

$$x_n = 1 + \frac{1}{x_1 \cdots x_{n-1}}.$$

   Show that there is an integer m so that $x_1 \cdots x_m > 100$. HINT: Proof by contradiction.

3. Exercise 1.5.H in the text.
4. Exercise 2.2.H in the text.
5. Exercise 2.3.A(e) in the text. *Optional:* What is the smallest value of N that satisfies the limit definition for $\epsilon = 10^{-6}$? Justify your answer, of course.
6. (a) Exercise 2.3.D in the text.
   (b) Find convergent sequences (a_n) and (b_n) so that
      i. $a_n \leq b_n$ for all n,
      ii. there is no N so that for all $n \geq N$, $a_n \leq \lim_{n\to\infty} b_n$, and
      iii. there is no N so that for all $n \geq N$, $b_n \geq \lim_{n\to\infty} a_n$.