Homework #8: Sequences and Review of Induction
Due Date: November 17, 2005
Student: Jan Voung (jvoung@cs.ucsd.edu)

Solutions to IS {2.1, 2.2, 2.3} and Review Questions {1, 2, 4, 7} are in the book.

Comments:

- 2.1(b) where $a_n = 1$ for all $n \geq 0$ is bounded even though the book answers say otherwise.
- Convergence can be shown by finding a limit (for $n \to \infty$).
- Divergence can be shown by showing that a limit does not exist (for $n \to \infty$).
- A few students were sloppy with equations involving limits. For example, saying

$$\frac{2n^3 + 3n + 1}{3n^3 + 2} = \frac{2n^3 + 3n + 1}{3n^3 + 2} \cdot \frac{\frac{1}{n^3}}{\frac{1}{n^3}}$$

is fine, since you're just multiplying by 1. However, saying

$$\frac{2n^3 + 3n + 1}{3n^3 + 2} = \frac{6n^2 + 3}{9n^2}$$

is not correct. Of course, the intention is to use L'Hopital's rule. The rule only says that the limits are equal:

$$\lim_{n \to \infty} \frac{2n^3 + 3n + 1}{3n^3 + 2} = \lim_{n \to \infty} \frac{6n^2 + 3}{9n^2}$$