Problem 1. Show that the sequence $\{-1\}^n$ is bounded above and below, and it does not have a limit.

Problem 2. Show that the sequence $\left\{ \frac{n-1}{3^n} \right\}$ is strictly decreasing.


Problem 4. Prove that the sequence $a_n = \frac{2^{2n} (n!)^2}{(2n+1)!}$ has a limit.

Problem 5. Show that the sequence $a_n = 1 + \frac{1}{3} + \frac{1}{5} + \cdots + \frac{1}{2n-1}$ is not bounded above.

Problem 6. Let $\{a_n\}$ and $\{b_n\}$ be increasing. Is the sequence $\{a_n^2 + b_n^2\}$ increasing? Proof or counterexample.

Problem 7. Problem 2-4 page 32.

Problem 8. Exercise 3.1.1 (b), (c), (e) Page 46.

Problem 9. Exercise 3.2.3 Page 46.

Problem 10. Exercise 3.4.2 Page 47.