1. Let $a_n = 3^n/n!$. Prove or disprove that $\sum_{n=1}^{\infty} a_n$ converges.

2. Let $a_n(x) = (-x)^n/2^n$. Find all values of $x$ so that $\sum_{n=1}^{\infty} a_n(x)$ converges. Prove all assertions of convergence or divergence.

3. Let $a_1 = \sqrt{2}$, $a_2 = \sqrt[4]{2}$, $a_3 = \sqrt[8]{2}$, $a_4 = \sqrt[16]{2}$. Prove that $\lim a_n$ exists and determine (with proof) the value of the limit.

Exercise 2.7.13.
Exercise 3.2.1
Exercise 3.2.2
Exercise 3.2.3
Exercise 3.2.5
Exercise 3.2.13
Exercise 3.3.1