MATH2050C Assignment 4

Deadline: Feb 7, 2018.

Hand in: Section 3.1 no. 5d, 6d, 10, 17; Section 3.2 no. 10a, 11b, 12.

Section 3.1 no. 2, 3, 5, 6, 7, 10, 17, 18;

Section 3.2 no. 1cd, 2, 5, 10a, 11, 12.

This is basic stuff. You are strongly advised to do all exercises in these sections unless you feel confident after working out some of them. No supplementary exercises this time.

Supplementary Exercise

(1). Let $p(x) = a_0 + a_1 x + \cdots + a_n x^n, a_n \neq 0$, and $q(x) = b_0 + b_1 x + \cdots + b_m x^m, b_m \neq 0$, be two polynomials. Consider the sequence $x_k = p(k)/q(k), k \geq 1$, (when k is large, $q(k)$ does not vanish, so you may assume that q is always non-zero). Prove that

(a) When $n = m$, $\lim_{k\to\infty} x_k = a_n/b_m$;

(b) When $n > m$, $\{x_k\}$ does not converge ; and

(c) When $n < m$, $\lim_{k\to\infty} x_k = 0$.