

MATH 2050A - HW 2

Due Date: 29 Sep 2020, 23:59

(Please submit assignments to Blackboard and follow the instructions there.)

Problems: P.61 Q5, 8

(2 Questions in total)

Textbook: Bartle RG, Sherbert DR(2011). Introduction to Real Analysis, fourth edition, John Wiley Sons,Inc.

We type here all the required problems *for your convenience only*. The presentation of the problems here may be different from the original one but the respective solution should be unaffected.

1 (P.61 Q5). Use the definition of the limit of a real sequence to establish the following limits.

a) $\lim \left(\frac{n}{n^2 + 1} \right) = 0$

b) $\lim \left(\frac{2n}{n + 1} \right) = 2$

c) $\lim \left(\frac{3n + 1}{2n + 5} \right) = \frac{3}{2}$

d) $\lim \left(\frac{n^2 - 1}{2n^2 + 3} \right) = \frac{1}{2}$

2 (P.61 Q8). Let (x_n) be a sequence of real numbers.

1. Prove that $\lim(x_n) = 0$ if and only if $\lim(|x_n|) = 0$
2. Give an example to show that the convergence of $(|x_n|)$ need not imply the convergence of (x_n)