

**MATH 2050A - HW 4**

**Due Date:** 20 Oct 2020, 23:59

*Please use only results and definitions you have learnt.*

*If you insist using external results, please prove them using what you have learnt.*

*(Especially for Q3)*

**Problems:** P.84 Q4a, 7a, 8a

(3 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.84 Q4a). Show that the following sequence is divergent.

$$\left(1 - (-1)^n + \frac{1}{n}\right)$$

**2** (P.84 Q7a). Establish the convergence for the following sequence and find its limit.

$$\left(\left(1 + \frac{1}{n^2}\right)^{n^2}\right)$$

**3** (P.84 Q8a). Determine the limit of the following sequence. (It is possible that the limit does not exist).

$$\left((3n)^{\frac{1}{2n}}\right)$$