

HOMWORK 4

due date: November 16, 2018

a) Compute the limit

$$\lim_{n \rightarrow \infty} \frac{5^n + n^7}{n^2 + n + 7^n}.$$

b) Compute the limit

$$\lim_{n \rightarrow \infty} \sqrt{n} \left(\sqrt{n^5 + n^2} - \sqrt{n^5 - 4} \right).$$

c) Find the sets

$$\bigcap_{n \in \mathbb{N}} \left[0, \frac{10n^2}{5n^2 + 3n - 2} \right) \text{ and } \bigcup_{n \in \mathbb{N}} \left[0, \frac{10n^2}{5n^2 + 3n - 2} \right).$$

d) Find a converging sub-sequence of the sequence $\{a_n\}_{n \in \mathbb{N}}$

$$a_n = \frac{(-1)^n + \frac{1}{n}}{2}.$$