

Exercises Analysis 1 (2WA30) Lecture 11

1. (★) Kosmala Ex 8.3.5

2. a) Show: The function series

$$\sum_{k=0}^{\infty} \frac{x^k}{k!}$$

converges uniformly on each bounded interval in \mathbb{R} .

b) (★) Show: This series does not converge uniformly on \mathbb{R} .

3. Kosmala Ex 8.4.1. (a) – (e)

4. Kosmala Ex 8.4.11

5. Let $[a, b]$ be a bounded and closed interval. Let (f_n) be a sequence of nonnegative, continuous functions on $[a, b]$ such that $\sum f_n$ is pointwise convergent, and the sum function s given by

$$s(x) = \sum_n f_n(x)$$

is continuous as well. Show: The series of functions $\sum f_n$ is uniformly convergent. (**Hint:** Use Dini's theorem.)