

Math 131
Homework 8

Read section 4.1 and 4.2 of Rosenlicht.

1a) Give an example of a pair of functions $f : \mathbb{R} \rightarrow \mathbb{R}$ and $g : \mathbb{R} \rightarrow \mathbb{R}$ such that g is continuous, and $b \in \mathbb{R}$, and

$$\lim_{x \rightarrow g(b)} f(x) \neq \lim_{z \rightarrow b} f(g(z))$$

b) Let $f : \mathbb{R} \rightarrow \mathbb{R}$ and $g : \mathbb{R} \rightarrow \mathbb{R}$ be functions such that g is a continuous bijection with a continuous inverse, and $b \in \mathbb{R}$. Prove that $\lim_{x \rightarrow g(b)} f(x)$ exists iff $\lim_{z \rightarrow b} f(g(z))$ exists and if both limits exist then they are equal.

Also do problems 2, 3, 4, and 8 page 91 of Rosenlicht.