

Problems for lecture 18

February 27, 2015

Recall that a function $f(x)$ is not uniformly continuous on a set A if and only if there is an $\epsilon > 0$ and two sequences x_n, y_n in A so that $|x_n - y_n| \rightarrow 0$ and $|f(x_n) - f(y_n)| > \epsilon$ for every $n \in \mathbb{N}$.

1. Show that the function

$$f(x) = \frac{1}{x^2}$$

is not uniformly continuous on $(0, 1]$.

2. Show that the function

$$f(x) = x^3$$

is not uniformly continuous on \mathbb{R} . Hint try to find two good sequences that approach ∞ .