

Limits of Functions Worksheet

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1 Exercises

I. Prove Theorem 1.1.

II. Use the limit definition to prove the following limit

$$\lim_{x \rightarrow 5} (x^2 - 3x + 1) = 11.$$

III. Define $f: \mathbb{R} \rightarrow \mathbb{R}$ by $f(x) = x$ if x is rational and $f(x) = 0$ if x is irrational. Prove that f has a limit at $c \in \mathbb{R}$ if and only if $c = 0$.