Quiz 2 MA 107 (Max. Marks 10)
IIT Bombay, 18th March 2019

(1) Show that for $x, y \in \mathbb{R}$, $\min\{x, y\} = \dfrac{x + y - |x - y|}{2}$. [2]

(2) Identify the set $\{x \in \mathbb{R} || x - 3| < 5\}$ (with proof). [3]

(3) Find the limit (with proof) of the sequence $a_n = \frac{1}{n^2}$ for all $n \in \mathbb{N}$, if it exists, else prove that the sequence diverges. [3]

(4) Let $f : X \to Y$, and $A \subset X$. Show that $A \subset f^{-1}(f(A))$. Give an example to show that they may not be equal. [2]