

MATH 2010-2 FALL 2024 PRACTICE TEST #2

Write clearly, on separate paper.

- (1) [5pts.] Let $\{E_i \mid i \in I\}$ be an indexed family of nonempty subsets of a bounded subset E of \mathbb{R} . Show that

$$\inf \bigcup_{i \in I} E_i = \inf \{ \inf E_i \mid i \in I \}.$$

- (2) [4pts.] Show that the function $f: [-2, 1] \rightarrow \mathbb{R}; x \mapsto x^3 - 3x^2 + 5$ is bounded.

- (3) [5pts.] Prove directly, from the definition of the limit of a sequence, that

$$\lim_{n \rightarrow \infty} \frac{3}{n^2} = 0.$$