

MATH 201C FALL 2016 PRACTICE TEST #2

Write clearly, on separate paper.

- (1) [5pts.] For a positive integer n and real numbers x_1, x_2, \dots, x_n , give a careful proof that

$$\min\{x_1, x_2, \dots, x_n\} \leq \frac{x_1 + x_2 + \dots + x_n}{n} \leq \max\{x_1, x_2, \dots, x_n\}.$$

- (2) [4pts.] Find a number M such that $|x^3 - 4x^2 + x| \leq M$ for all $-2 \leq x \leq 3$. Justify your claim.
- (3) [5pts.] Consider bounded functions $f: D \rightarrow \mathbb{R}$ and $g: D \rightarrow \mathbb{R}$ defined on a subset D of \mathbb{R} . Suppose that $f(x) \leq g(x)$ for all x in D . Prove or disprove:

$$\inf_{x \in D} f(x) \leq \inf_{x \in D} g(x).$$