

MATH 201B FALL 2013 PRACTICE TEST #2

Write clearly, on separate paper.

- (1) [3pts.] For positive real numbers x, y , show that

$$\sqrt{xy} \leq \frac{x+y}{2}.$$

- (2) [4pts.] For real numbers x, y , suppose $y - x > 1$. Prove:

$$\exists n \in \mathbb{Z}. n \in (x, y).$$

- (3) [3pts.] Find a number M such that $|x^3 + x^2 - 2x| \leq M$ for all $-1 \leq x \leq 2$.

- (4) [3pts.] Is the sequence $\{1/\sqrt[4]{n}\}$ convergent? If so, what is the limit? (Justify your answers.)