

## MATH 240WM PROJECT 2

### 1. DESCRIPTION

Please upload your paper to Gradescope. For this paper, I would like you to follow the steps below to study the properties of the Cantor set in Exercise 6 in §27 of the textbook.

- (1) Define the following terms: *totally disconnected*, *isolated point*, *Cantor set*.

**Hint** See both documents on the course page.

- (2) Provide a remark to explain that, in the definition of the Cantor set in Exercise 6 in §27 of the textbook, the set

$$A_{n-1} - \bigcup_{k=0}^{\infty} \left( \frac{1+3k}{3^n}, \frac{2+3k}{3^n} \right)$$

is in fact  $A_{n-1}$  minus finitely many intervals of the form  $\left( \frac{1+3k}{3^n}, \frac{2+3k}{3^n} \right)$ .

- (3) Do Exercise 6 in §27 of the textbook.

The file of §27 is available on the course page.

### 2. EXPECTATIONS

Your paper should have a title, and the title and your name should appear on the first page, preceding any other material. Your paper should be clearly written in L<sup>A</sup>T<sub>E</sub>X, using complete sentences and paragraphs, with displayed mathematical equations only as needed. You are encouraged to use the Definition-Theorem-Proof format common to mathematical writing (our textbook is a good example of this). Your paper should not just be a list of definitions, theorems, and proofs however – there should be writing between these components which links them. Definitions, theorems, lemmas, and corollaries should be clearly and precisely stated in mathematical language.

**You should not collaborate with others on the first draft of the paper. Please proofread before turning in the paper.**

### 3. GRADING CRITERIA

- Does the paper address the mathematics correctly without major errors?
- Does the paper assume an appropriate level of knowledge and provide relevant definitions and background?
- Does the paper have an organizational structure that supports meaning and makes it easy for the reader to understand?
- Does the paper contain a minimum of sentence-level issues that impair meaning?

Generally speaking, “A” papers are those where all of the major objectives listed above are unambiguously achieved. In “B” papers, most of the major objectives have been achieved, but one or two elements need work. In “C” or “D” papers, many “C” or all “D” of the elements still require work.