

# Homework 1

Your Name

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## Section 2.1

Let  $m : \mathcal{A} \rightarrow [0, \infty)$  be a set function where  $\mathcal{A}$  is a  $\sigma$ -algebra. Assume  $m$  is countably additive over countable disjoint collections of sets in  $\mathcal{A}$ .

### Problem 1

Given sets  $A$ ,  $B$ , and  $C$ , if  $A \subset B$  and  $B \subset C$ , then  $A \subset C$ .

*Proof.* Other symbols you can use for set notation are

- $A \supset B \supseteq C \subset D \subseteq E$ . Also  $\emptyset$  vs  $\emptyset$
- $\cup$  and  $\bigcup_{k=1}^{\infty} E_k$
- $\cap$  and  $\bigcap_{x \in \mathbb{N}} \{ \frac{1}{\sqrt{x}} \}$
- $\bigcup$  and  $\bigcap_{k=0}^n$  and  $\bigcap$
- most Greek letters  $\sigma \pi \theta \lambda_i e^{i\pi}$
- $\int_0^2 \ln(2)x^2 \sin(x) dx$
- $\leq < \geq > \neq$

If you want centered math on its own line, you can use a slash and square bracket.

$$\left\{ \sum_{k=1}^{\infty} l(I_k) : A \subseteq \bigcup_{k=1}^{\infty} \{I_k\} \right\}$$

The left and right commands make the brackets get as big as we need them to be. □

## Problem 2

Given...

*Proof.* Let  $\epsilon > 0$ . If you have a shorter statement that you still want centered, use two \$\$ on either side.

$\exists$  some  $\delta > 0 \mid \dots$

□

## Problem 3

*Proof.*

□

## Section 2.2

### Problem 6

Blah

### Problem 7

Blah

### Problem 10

Blah