



## TOTAL VARIATION

### Why

We want a norm on the space of measures.

### Definition

The *total variation* of finite measure is the variation measure of the base set. We show below that the total variation is a norm on the vector space of finite measures.

### Notation

Let  $(X, \mathcal{A})$  be a measurable space and  $\mu : X \rightarrow \mathbf{R}$  be a finite signed measure. We denote the total variation by  $\|\mu\|$ .

Let  $|\mu|$  be the variation of  $\mu$ . Then,  $\|\mu\| = |\mu|(X)$ .



