Measurable Sections

1 Why

Toward a theory of iterated integrals, we need to know that set and function sections are measurable.

2 Results

Proposition 1. *Let $(X, \mathcal{A})$ and $(Y, \mathcal{B})$ be measurable spaces. For any $E \in \mathcal{A} \times \mathcal{B}$, the sections E_x and E^y are measurable for any $x \in X$ and $y \in Y$.*

Proof. TODO □

Proposition 2. *Let $(X, \mathcal{A})$ and $(Y, \mathcal{B})$ be measurable spaces. Let $f : X \times Y \to F$, where F is the extended real numnbers or the complex numbers, and f is measurable (using the appropriate sigma algebra of the codomain). The sections $f_x : Y \to F$ and $f^y : X \to F$ are measurable for each $x \in X$ and $y \in Y$.*

Proof. TODO □