

ECON 770. Intro to Econometrics

Recitation 5.

Stanislav Khrapov

09/28/07

1. Let $X : \Omega \rightarrow \Omega'$, $\mathcal{G} \subset \mathcal{P}(\Omega')$. Show that

$$\sigma[X^{-1}(\mathcal{G})] = X^{-1}[\sigma(\mathcal{G})].$$

2. Show that

$$\begin{aligned} P^{X,Y}([x, x+h] \times]y, y+k]) \\ = F_{X,Y}(x+h, y+k) - F_{X,Y}(x, y+k) - F_{X,Y}(x+h, y) + F_{X,Y}(x, y). \end{aligned}$$

3. Let Ω be any set, and let $\mathcal{F} = \{\emptyset, \Omega\}$. Show that a function $f : \Omega \rightarrow \mathbb{R}$ is \mathcal{F} -measurable if and only if f is constant.

Now let \mathcal{G} be the field generated by two sets A, B with $B \subset A \subset \Omega$. Which functions from Ω to \mathbb{R} are \mathcal{G} -measurable?

4. Suppose that f and g are \mathcal{F} -measurable functions from Ω to \mathbb{R} . Show that the function $h(x) = \min\{f(x), g(x)\}$ is \mathcal{F} -measurable.