Lemma 0.0.1 (Doob's measurability theorem)**.** *Let $X : \Omega \to \Psi$ be a mapping and $(\Psi, \mathcal{G})$ a measurable space. A function $Y : \Omega \to \mathbb{R}$ is $\sigma(X)$-measurable if and only if there exists a $\mathcal{G}$-measurable function $h : \Psi \to \mathbb{R}$ s.t. $Y = h(X)$.*