That u is a viscosity solution

We can extend the work for the heat equation to generic parabolic partial differential equations. We do this by first introducing viscosity solutions to Kolmogorov PDEs as given in Crandall & Lions crandall$_lionsandfurtherextended, esp. in Beck_2021. Some Preliminaries We take work previously pioneered by Ito 1942a and$ $apply concepts first applied in Beck_2021 and BHJ21. lemma lemma: 2.7 Let$d,m $\in$, $T \in (0, \infty)$. Let $\mu \in C^{1,2}([0,T] \times^d, ^d)$ and $\sigma \in C^{1,2}([0,T] \times^d, ^{d \times m})$ satisfying that they have non-empty compact supports and let $S = (\mu) \cup (\sigma) \subseteq [0,T] \times^d$. Let $(\Omega, F, P, (F_t)_{t \in [0,T]})$ be a filtered probability space satisfying usual conditions. Let $W : [0,T] \times \Omega \to^m$ be a standard $(F_t)_{t \in [0,T]}$ -Brownian motion, and let $X : [0,T] \times \Omega \to^d$ be an $(F_t)_{t \in [0,T]}$-adapted stochastic process with continuous sample paths satisfying for all $t \in [0,T]$ with P-a.s. that: align X$_t = X_0 + \int_0^t \mu(s, X_s) ds + \int_0^t \sigma(s, X_s) dW_s$