This document contains 2 questions.

Question 1

(Total: 0 marks)

[default,M11]

Consider a *quanto call* option, which has payoff $X_T = (E_0 S_T - k)^+$ at maturity T, where S is the value of a foreign asset in the foreign currency, the strike price k is set in the domestic currency, and E_0 is the exchange rate between currencies at time 0 (so that $E_0 S_0$ is the value at time 0 of the foreign asset in the domestic currency).

You are a British investor and have to compute the price (in £) X_0 at time 0 of a quanto call option with strike £8, whose underlying, a stock traded in Germany, is modelled as having the following values in € at maturity $N = 2$

ω	HH	HT	TH	TT
$S_2(\omega)$	1	13/4	4	9

Suppose the domestic (i.e. for £) interest rate is the constant $r = \frac{1}{4} = 25\%$, the foreign (i.e. for €) interest rate is the constant $q = 1 = 100\%$, and the exchange rate E between £ and € (defined as the cost of one € in £) is modelled as

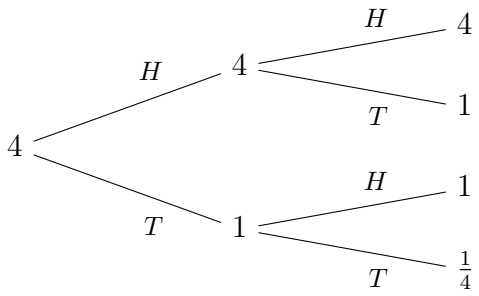

Figure 1: Tree of E.

Consider the market composed of the domestic and foreign bank accounts, and the foreign asset.

(a) Are there values of S_0, S_1 for which there is no arbitrage ?
A. No B. Yes

(b) To what interval of values does the unique arbitrage-free price X_0 of X at time 0 belong to?
A. $(-\infty, 0]$ B. $(0, 3)$ C. $[3, 4)$ D. $[4, 6)$ E. None of the above

Question 2

(Total: 0 marks)

[default,M20]

Model a risky asset S with a 2-period binomial model with constant up factor 2 and down factor 1/2 and initial value $S_0 = 4$, and a bank account with constant interest rate $r = 1/4$.

1. What is the price at time 0 of the American put option on S with strike price $K = 5$?
A. $\frac{2}{5}$ B. $\frac{34}{25}$ C. $\frac{24}{25}$ D. None of the above
2. Let τ^* be the smallest optimal exercise time. Which of the following statements about τ^* are correct?
A. $\tau^*(HH) = 2$ B. $\tau^*(HT) = 2$ C. $\tau^*(TH) = 1$ D. $\tau^*(TT) = 2$