1. Consider the hypothetical country of Elbonia, where the government has declared a “currency band” policy, in which the exchange rate between the domestic currency, the Elbonian Bongo Buck, denoted by EBB, and the US Dollar is guaranteed to fluctuate in a prescribed band, namely:

\[ 0.95 \text{USD} \leq \text{EBB} \leq 1.05 \text{USD} \]

for at least one year. Suppose also that the government has issued 1-year notes denominated in the EBB that pay a continuously compounded interest rate of 30%. Assuming that the corresponding continuously compounded interest rate for US deposits is 6%, show that there is an arbitrage opportunity.

2. Consider a market that has

(a) a stock (also called a security or asset), current price \( S \)

(b) a loan market so that money (also called a bond) can be borrowed or loaned at an annual interest rate of \( r \) compounded continuously.

At the end of a time period \( T \), the security will either increase in value by a factor \( U \) to \( SU \), or decrease in value by a factor \( D \) to value \( SD \). Show that a forward contract with strike price \( k \) that, is, a contract to buy the security at time \( T \) with potential values \( SU - k \) and \( SD - k \)
should have the strike price set at $S \exp(rT)$ to avoid an arbitrage opportunity.